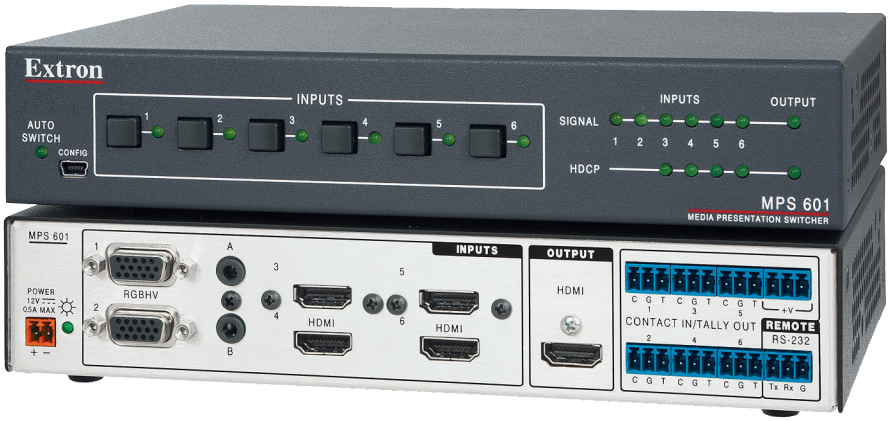
User Guide

HDMI Switchers

MPS 601

Media Presentation Switcher



Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-2454-01 Rev. A
03 14

Safety Instructions

Safety Instructions • English

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ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

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Instructions de sécurité • Français

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Korean

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Conventions Used in this Guide

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CAUTION: A caution indicates a situation that **may** result in minor injury.

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
Esc X1 * X17 * X20 * X23 * X21 CE ←
```

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" is the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

Contents

Introduction 1
- About this User Guide 1
- About the MPS 601 1
- Features 2

Installation 4
- Mounting the Switcher 4
- Connections 4
  - Power and Input 5
  - Output 5
  - Control Devices 6
- Contact Closure and Tally Output Application Diagrams 7
- Lockit Lacing Brackets 9
- Cabling the MPS 601 Switcher 10

Operation 11
- Front Panel Features 11
- HDCP 12
- Audio Features 12
  - Mode 1 (Default) 12
  - Mode 2 13
  - Mode 3 13
  - Autodetect for Audio 14
- Auto-input Switching 14
- Front Panel Lockout (Executive Mode) 14
- Reset Mode 14
- EDID Minder 15
  - Automatic Mode 15
  - User assigned EDID Mode 16

Remote Communication and Control 18
- Connection Options 18
  - Remote Control Port (RS-232) 18
  - Front Panel Configuration Port 19
- Host-to-MPS Communications 21
  - MPS Switcher-initiated Messages 21
  - MPS Switcher Error Responses 21
- Command and Response Table 22

Configuration Software 28
- Installing the Software 28
- Starting the Software 29
  - Connect to Online Device 29
- Using the Software 30
  - Connections Menu 30
  - Tools Menu 31
- Navigating the PCS Application 33
  - AV Controls Panel 33
- Configuration Pages 34
  - Input/Output Configuration 34
  - EDID Minder Page 36
  - Image Settings Page 38
  - Audio Config Page 39
  - Device Settings Page 40
- Hardware Pages 41
  - Unit Information Page 41
  - Device Name Page 41
  - Executive Mode Page 42
  - Reset Device Page 43

Reference Information 44
- Mounting Options 44
  - UL Rack Mounting Guidelines 44
  - Rack Mounting 45
  - Table or Wall Mounting 45
  - Through-desk Mounting 46
- DataViewer 47
- Updating Firmware 48

Introduction

This section describes this guide and features of the MPS 601, including:

- **About this User Guide**
- **About the MPS 601**
- **Features**

About this User Guide

This guide contains information to install, configure, and operate the Extron MPS 601 Media Presentation Switcher.

In this guide, the MPS 601 can be referred to as “MPS”, “MPS 601” or “switcher.”

About the MPS 601

The Extron MPS 601 is a compact six input, one output media presentation switcher for digital and analog sources. It offers four, HDCP-compliant HDMI inputs and two RGB video inputs with analog stereo audio. RGB video and analog audio are digitized and switched through the HDMI output. The MPS 601 features two Extron-exclusive technologies: EDID Minder, which maintains continuous EDID communication between connected devices and Key Minder, which continuously authenticates and maintains HDCP encryption between input and output devices to ensure quick and reliable switching. The MPS 601 is ideal for applications that require routing digital and analog sources to a single display.

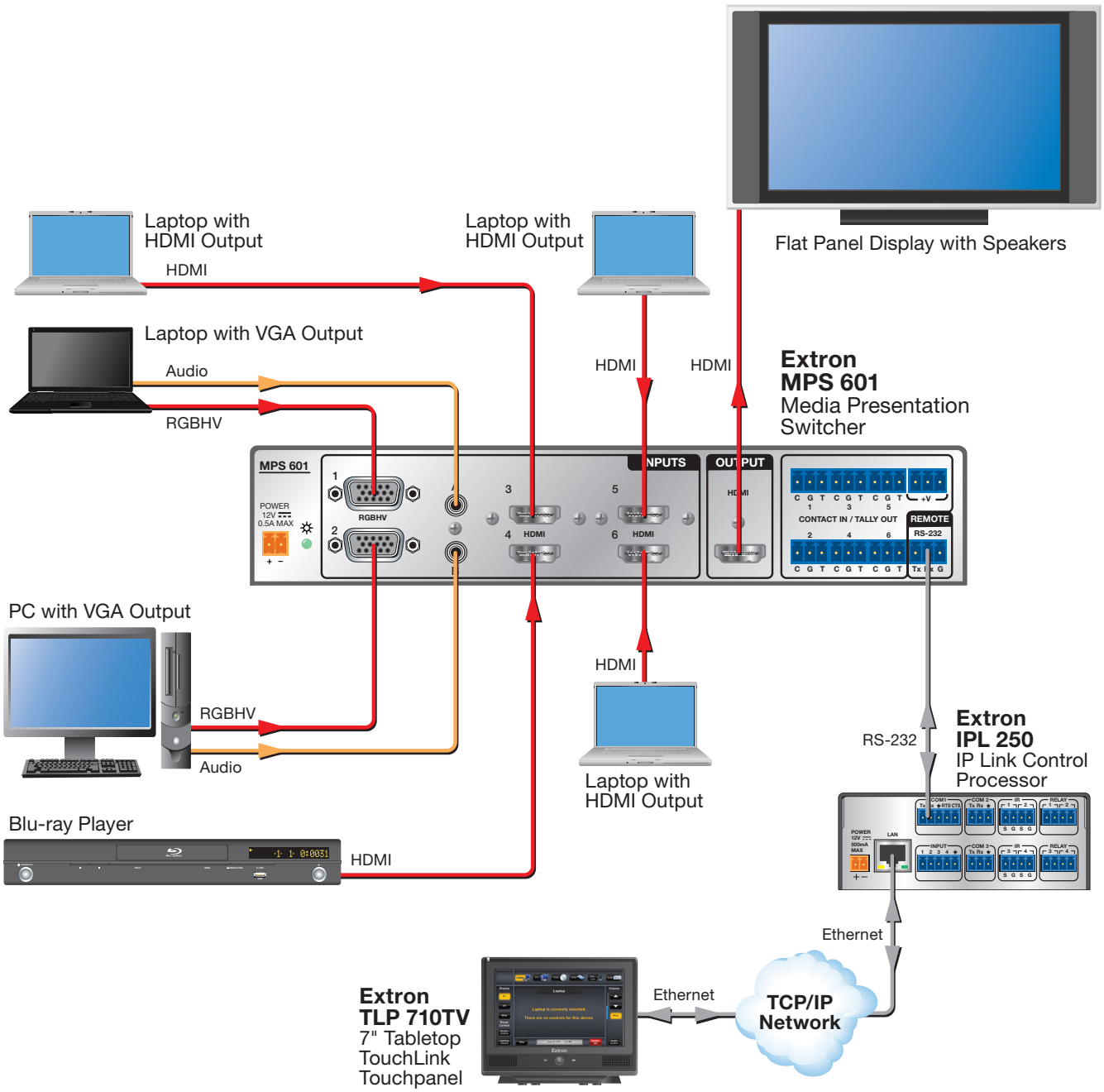


Figure 1. MPS 601 Application Diagram

Features

- **Presentation System Integration** — Integrates HDMI, RGB, and audio sources into presentation systems.
- **Inputs** — Includes four female HDMI type-A and two female 15-pin HD connectors for video; two female 3.5 mm TRS connectors for analog audio.
- **Output** — Includes one female HDMI type-A connector.
- **Four HDMI inputs and two RGB inputs** — Provides switching between HDMI and analog video sources.
- **Digitizes analog video and audio signals** — Provides a single video format and cable connection to the display.
- **HDMI audio embedding** — Embeds analog input audio signals onto the HDMI output signal.

- **EDID Minder** — Automatically manages EDID communication between connected devices ensuring that all sources power up properly and reliably output content for display.
- **Key Minder** — Continuously verifies HDCP compliance for quick, reliable switching.
- Support for computer-video to 1920x1200, including HDTV 1080p 60 Hz and 2K.
- **Supported HDMI specification features** — Include data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, Lip Sync, and HD lossless audio formats.
- **HDCP authentication and signal presence LED indicators** — Front panel LED indicators provide real-time feedback and monitoring of key performance parameters.
- **Automatic color bit depth management** — Automatically adjusts color bit depth of the currently selected HDMI input signal based on the display EDID, preventing color compatibility conflicts between HDMI source and display.
- **HDMI to DVI interface format correction** — Automatically reformats HDMI source signals for output to a connected DVI display.
- **Automatic input cable equalization to 50 feet (15 meters) at 1080p 60 Hz with 8-bit color when used with Extron HDMI Pro Series cable** — Actively conditions incoming HDMI signals to compensate for signal loss when using long cables, low quality cables, or source devices with poor HDMI signal output.
- **Control for video and audio muting** — Mutes video and audio signals by external contact closure or RS-232 control.
- **Audio input assignment** — Provides integration flexibiity. In normal operation, the analog audio inputs follow the corresponding RGB input. Alternately, they can be assigned to follow preset groups of RGB and digital inputs. Grouped inputs can share a common analog audio input. The HDMI output can be set to pass incoming digital audio, embed the analog audio, or to automatically embed the analog audio when no digital audio is detected.
- **Power on the HDMI output** — Provides +5 VDC, 250 mA.
- **Front panel security lockout** — Prevents unauthorized use in non-secure environments. In lockout mode, a special button combination is required to operate the switcher from the front panel controller.
- **Extron Product Configuration Software (PCS)**— Conveniently configure multiple products using a single software application.
- **Multiple control options** — Includes front panel, RS-232, contact closure, and auto-input switching.
- **Auto-input switching** — Switches to the highest- or lowest-numbered input (selectable) with an active video signal.
- **RS-232 control port** — Enables the use of serial commands for complete control and configuration via the Extron Windows®-based control program or integrated into a control system. Extron products use the Simple Instruction Set (SIS) protocol, a set of basic ASCII code commands that allow quick and easy programming.
- **Contact closure remote control with tally output** — Allows remote selection of an input channel. +5 VDC is provided to light an LED to indicate the currently selected input.
- **Rack-mountable, 1U, half rack width metal enclosure.**
- **LockIt HDMI cable lacing brackets.**
- **External universal power supply Energy-efficient** — Provides worldwide compatibility, low power consumption, and reduced operating costs.

Installation

This section describes the installation and the operation of the MPS 601, including:

- **Mounting the Switcher**
- **Connections**
- **Contact Closure and Tally Output Application Diagrams**
- **Lockit Lacing Brackets**
- **Cabling the MPS 601 Switcher**

Mounting the Switcher

The MPS 601 is housed in a 1U, full rack width rack- or desk-mountable metal enclosure. The switcher can also be surface-mounted under a table, desk, or podium, or on a wall.

See **Mounting Options** on page 44 for additional mounting details.

Connections

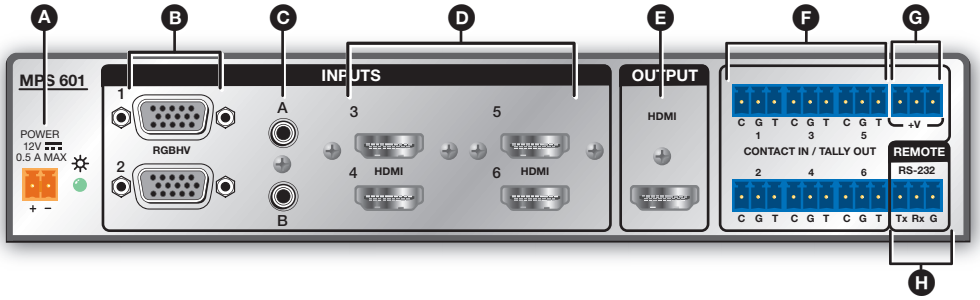


Figure 2. MPS 601 Rear Panel

Power and Input Connections

- **A** DC power connector.
- **B** Two Configurable analog 15-pin HD (VGA) connectors.
- **C** Two female 3.5 mm TRS connectors (lettered A and B on the rear panel) corresponding to the two RGBHV video inputs.
- **D** Four female HDMI connectors for HDMI compliant audio and video input (numbered 3, 4, 5, and 6 on the rear panel).

Output Connection

- **E** One female HDMI connector.

Control Device Connections

- **F** **Contact In/Tally Out** — Six 3.5 mm, 3-pole captive screw connectors for automatic input switching and tally indication using Extron Show Me cables.
- **G** **+V Port** — 3-pole 3.5 mm captive screw connector for +V output.
- **H** **RS-232** — 3-pole, 3.5 mm captive screw connector.

Power and Input

Ⓐ **AC power** — Connect to standard AC power: 100 to 240 VAC, at 50 or 60 Hz.

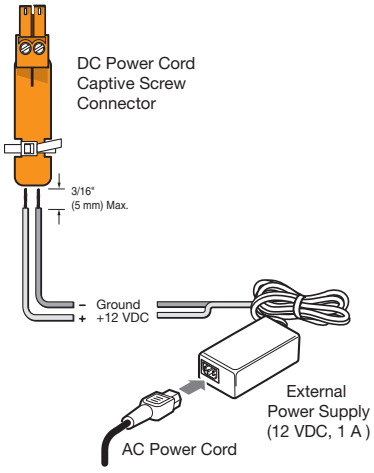


Figure 3. Power Supply Wiring

ATTENTION:

- Always use a power supply provided by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron AV processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium, or desk.
- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 725 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

Ⓑ **RGBHV video inputs** — Two female 15-pin HD connectors for VGA input (numbered 1 and 2 on the rear panel). The connectors accept analog VGA signals.

NOTE: The MPS 601 digitizes the RGBHV input signal. It does not scale or convert video to a different resolution. The output signal resolution is the same as the input resolution.

Ⓒ **Analog audio inputs** — Two female 3.5 mm TRS connectors. By default, input A is associated with RGBHV video input 1, and input B is associated with RGBHV video input 2. The analog input signal is digitized and embedded onto the HDMI output.

For additional audio input switching modes see **Audio Features** on page 12.

Ⓓ **HDMI video inputs** — Four female HDMI connectors for HDMI compliant audio and video input (numbered 3 through 6 on the rear panel). Connect to any HDMI source device using standard HDMI cables.

Output

Ⓔ **HDMI video output** — Connect an HDMI display device for output from the selected input.

Control Devices

F **Contact In and Tally Out** — Six 3.5 mm, 3-pole captive scrw connectors for automatic input switching and tally indication using Extron Show Me cables.

When a connected contact is grounded, the corresponding input is selected. At the same time, the tally output closes causing the Show Me LED on the connected cable to light (see **Contact Closure and Tally Output Application Diagrams** on page 7).

NOTE: For Show Me cables, the ground pin connection is optional.

The six contacts are mutually exclusive so that only one input is selected at at time.

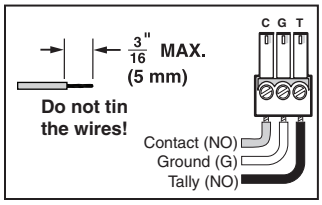


Figure 4. Contact In and Tally Out Connector Wiring

NOTE: Do not tin the leads. Tinned wires are not as secure in the connector and could be pulled out.

G **+V Port** — 3-pole, 3.5 mm captive screw connector. The three pins constantly output +5 VDC, 200 mA total (shared between pins) to provide power for external tally LEDs.

NOTE: Do not connect “Show Me” cables to the +V power connections.

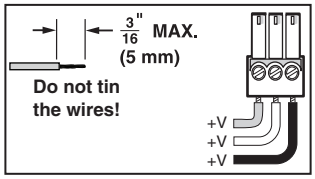


Figure 5. +V Connector Wiring

H **RS-232 remote** — 3-pole, 3.5 mm captive screw connector for a host computer or a controller using Simple Instruction Set (SIS) or Windows-based control software commands.

An IP Link driver allows Extron IPL and MediaLink devices to control the MPS 601 from the RS-232 remote connector.

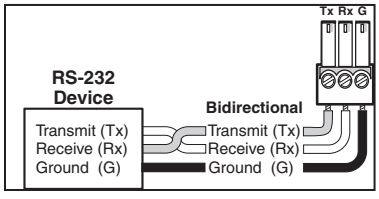


Figure 6. RS-232 Connector Wiring

C **USB configuration port (front panel)** — (see **Front Panel Features** on page 11) Female USB mini-B jack used for configuration of the switcher and firmware upgrades (see **Updating Firmware** on page 48).

Contact Closure and Tally Output Application Diagrams

The following diagrams show examples of various connections using the contact enclosure and tally output feature of the MPS 601.

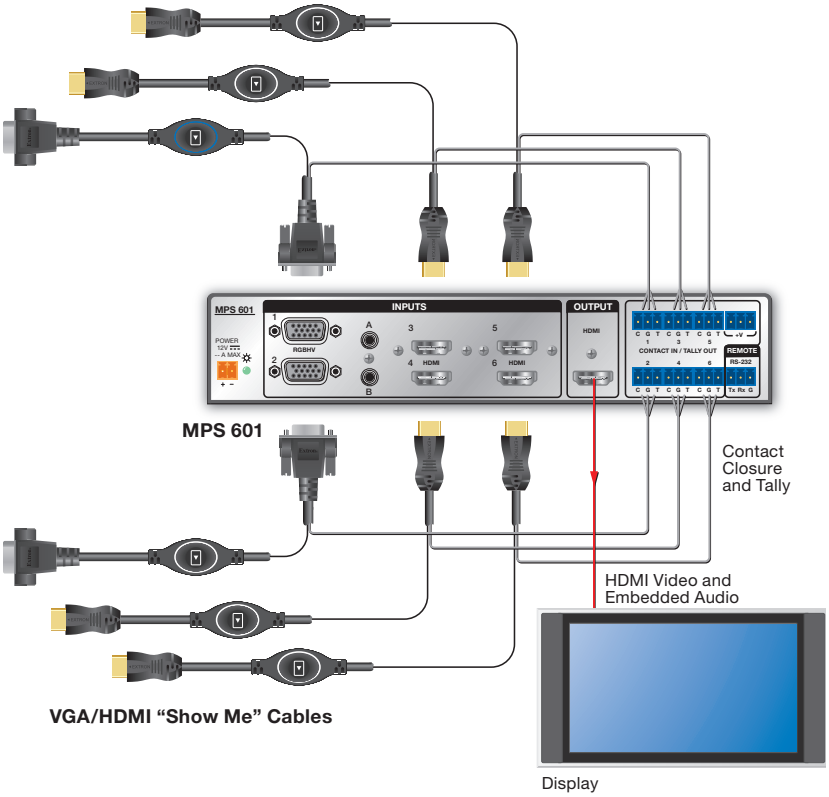


Figure 7. Contact Closure Application Diagram with Show Me Cables

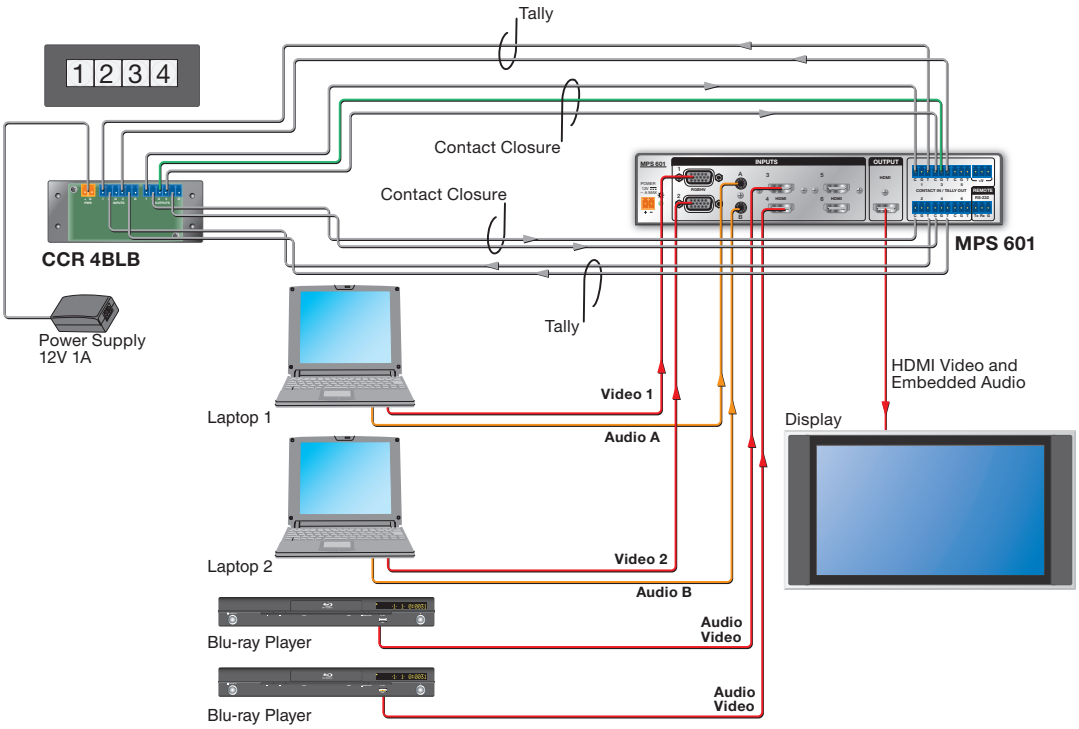


Figure 8. Contact Closure Application Diagram with CCR 4BLB

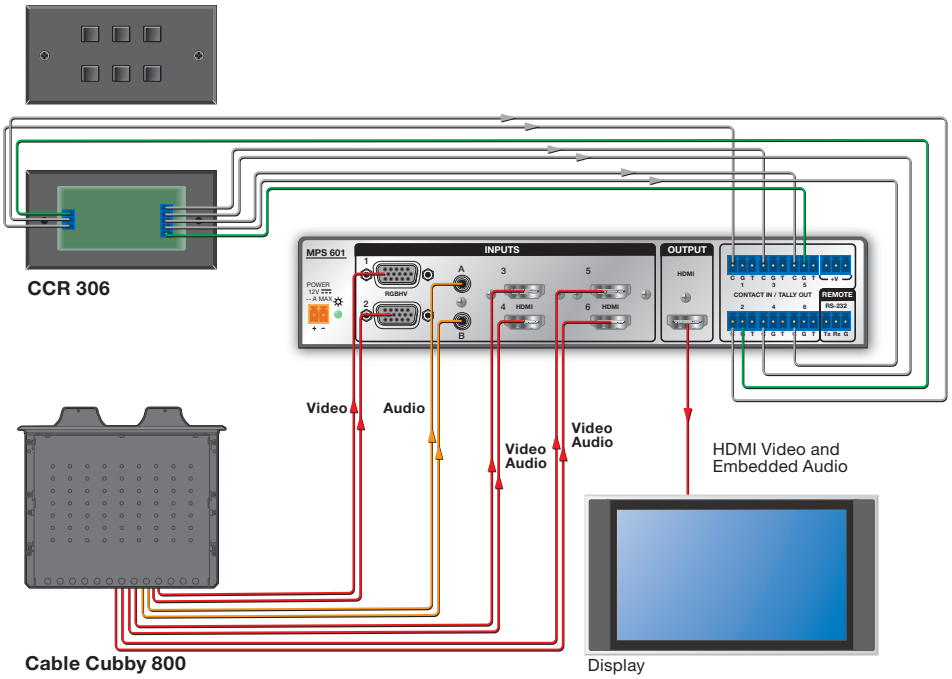


Figure 9. Contact Closure Application Diagram with CCR 306

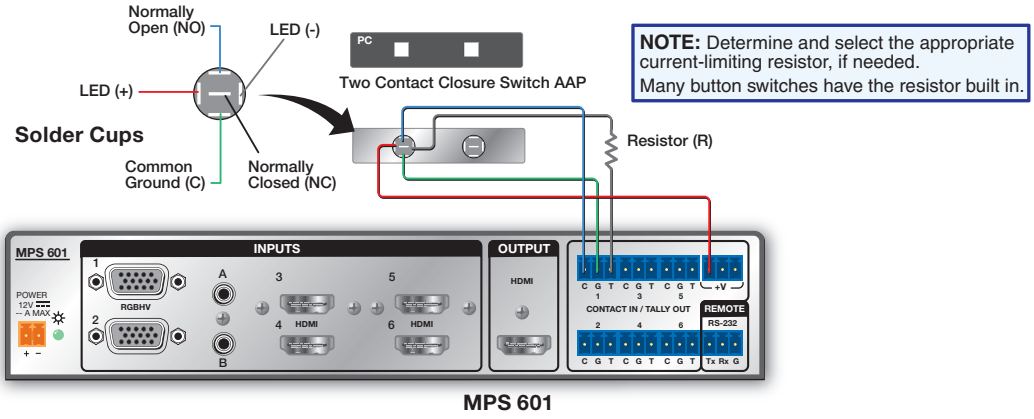


Figure 10. Contact Closure Application Diagram with Individual Switch

Lockit Lacing Brackets

The included Lockit lacing brackets secure the HDMI cables to the rear panel connectors as shown. The configuration of the HDMI connectors on the MPS 601 rear panel require using a top mount (HDMI output) and a stacked side mount (HDMI inputs 3 and 4 or inputs 5 and 6) installation to secure the four inputs and single output.

1. Loosen the HDMI connection mounting screw from the rear panel enough to allow the LockIt lacing bracket to be placed over it.

   NOTE: Do not remove the screw.

2. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket.
3. Plug the HDMI cable into the panel connection
4. Loosely place the included tie wrap around the HDMI connector and LockIt lacing bracket. Hold the connector securely against the lacing bracket and tighten the tie wrap, then remove any excess length.

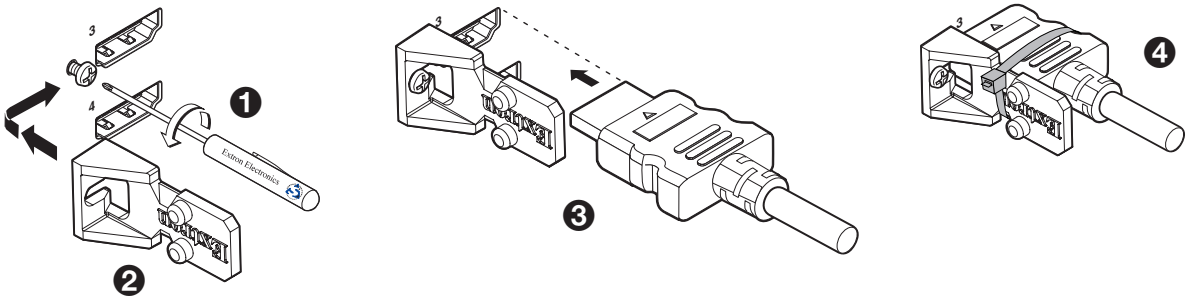


Figure 11. Lockit Lacing Bracket Installation

A single LockIt bracket can be used to secure two HDMI connectors in a stacked configuration as shown below.

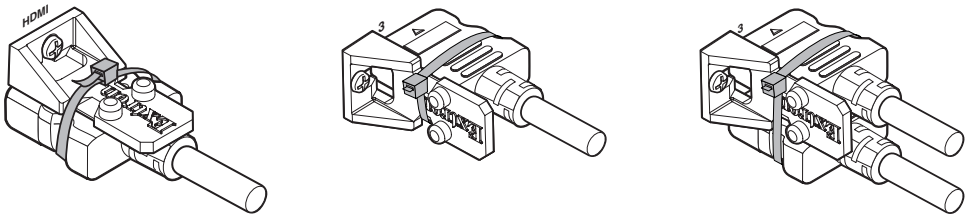


Figure 12. Lockit Lacing Bracket Examples

Cabling the MPS 601 Switcher

The switcher can be connected to as many as six input devices (RGBHV and HDMI). It can output to one HDMI device or display. Follow the steps below and the installation example (see **Figure 1** on page 2).

1. Turn off power to the switcher and all devices that will be connected to it.
2. Mount the switcher (see **Mounting Options** on page 44).
3. Attach up to two analog RGBHV, and four HDMI (or DVI-D with appropriate adapters) sources (see **Connections** on page 4).
4. Connect the HDMI output to a compatible display device (see **Connections** on page 4).
5. For analog audio input, connect audio sources to the corresponding audio inputs of the RGBHV video inputs (see **Connections** on page 4).
6. Connect a control PC or controller to the switcher using:
   a. The rear panel RS-232 port and a 3-pole captive screw connector (see **Remote Control Port (RS-232)** on page 18).
   b. The front panel USB configuration port (see **Front Panel Configuration Port** on page 19).
7. Power up the input and output devices, then connect power to the rear AC connector of the switcher.

Operation

This section discusses how to configure and operate the MPS 601. Topics that are covered include:

- **Front Panel Features**
- **HDCP**
- **Audio Features**
- **Auto-input Switching**
- **Front Panel Lockout (Executive Mode)**
- **Reset Mode**
- **EDID Minder**

Front Panel Features

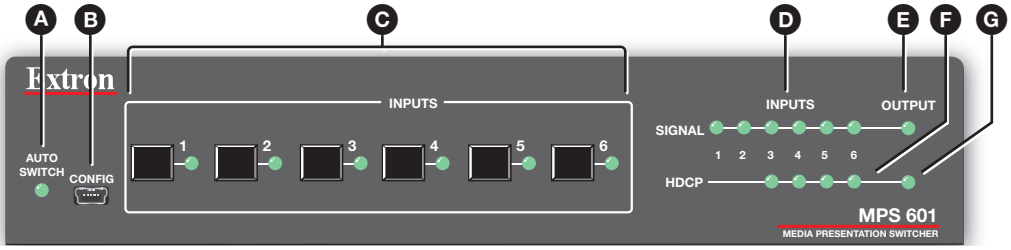


Figure 13. MPS 601 Front Panel

A **Auto Switch LED** — This LED lights when auto-input switching is active.

B **Config connector** — One female USB mini B port connects a host computer for configuring the switcher and upgrading firmware.

C **Input switching buttons** — Six buttons with associated green LEDs. Press an input button to switch an input to the HDMI output. Only one of the six inputs can be selected at a time.

D **Input signal LEDs** — Six green LEDs:

- The LEDs for RGB inputs 1 and 2 light when horizontal sync is detected on the input.
- The LEDs for HDMI inputs 3 to 6 light when TMDS clock activity is detected on the input.

NOTE: If a connected HDMI source is HDCP encrypted, the HDMI signal LED does not light until HDCP is authenticated. If HDCP authorization is disabled, the switcher does not display content with HDCP encryption.

E **Output signal LED** — This LED lights when the HDMI output is connected to a display or sink device.

F **HDCP input signal LEDs (inputs 4 to 6 only)** — These LEDs light when the connected source device is HDCP encrypted.

G **HDCP output LED** — This LED lights when the currently selected input source requires HDCP and the connected output device (sink) is authenticated.

HDCP

The HDMI group is HDCP compliant. When EDID Minder is enabled (default), HDCP is not supported if adapters are used to provide DVI inputs.

HDCP communication occurs between the selected input source and the output device directly (pass-though).

Audio Features

There are three audio modes to customize switching the digital and analog audio inputs to the output. They are selectable using SIS commands (see **Audio input mode** on page 24) or the PCS configuation software (see **Audio Config Page** on page 39). The modes are:

Mode 1 (Default)

When each RGBHV input has an associated audio input, the associated audio input follows the selected input.

- Audio input A follows input 1 (yellow box in figure 14, below).

  Input 1 selected: RGBHV 1 video and audio input A switch to the HDMI output.

- Audio input B follows input 2 (green box in figure 14, below).

  Input 2 selected: RGBHV 2 video and audio input B switch to the HDMI output.

- Inputs 3 through 6 selected: the associated embedded audio switches to the output.

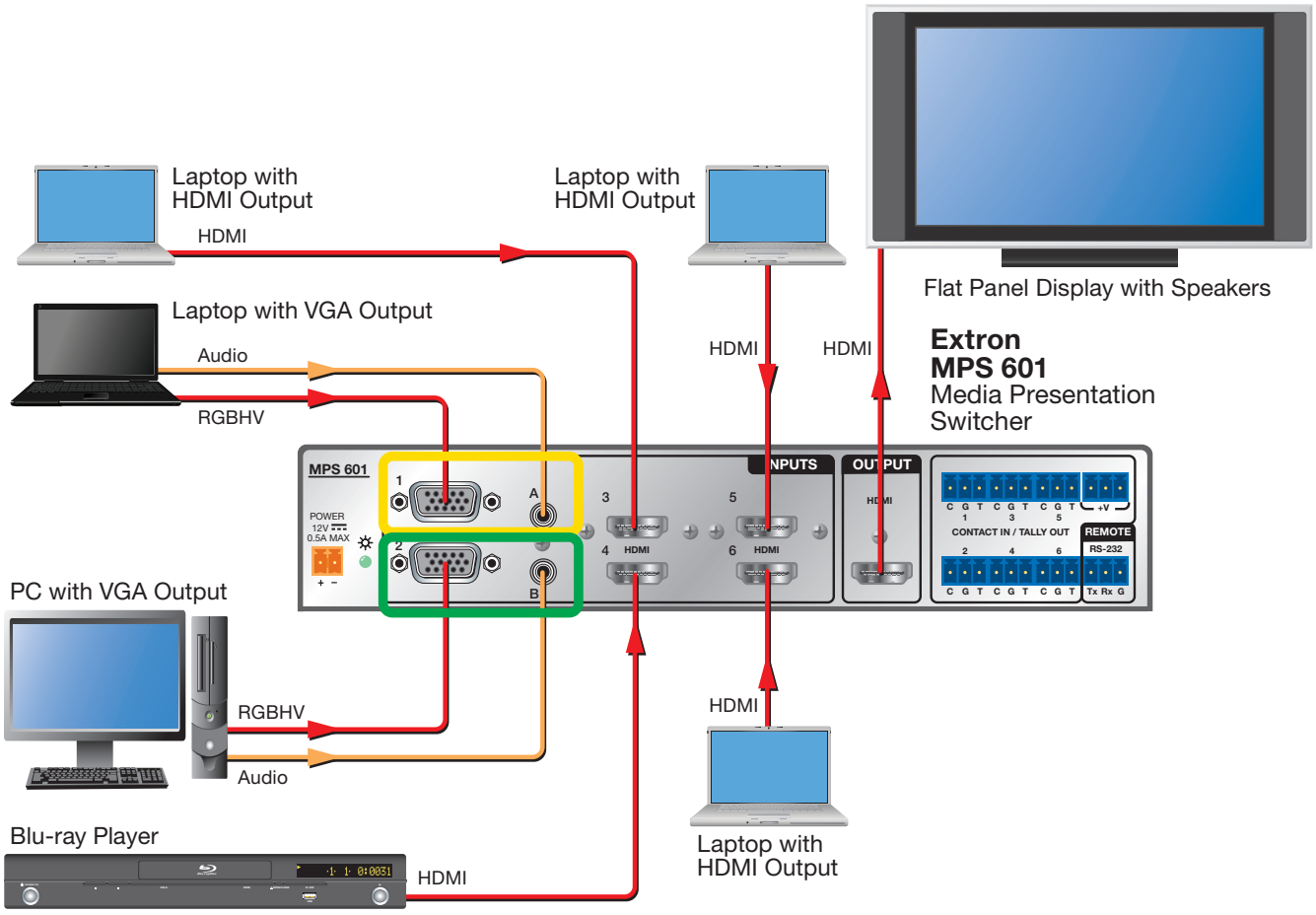
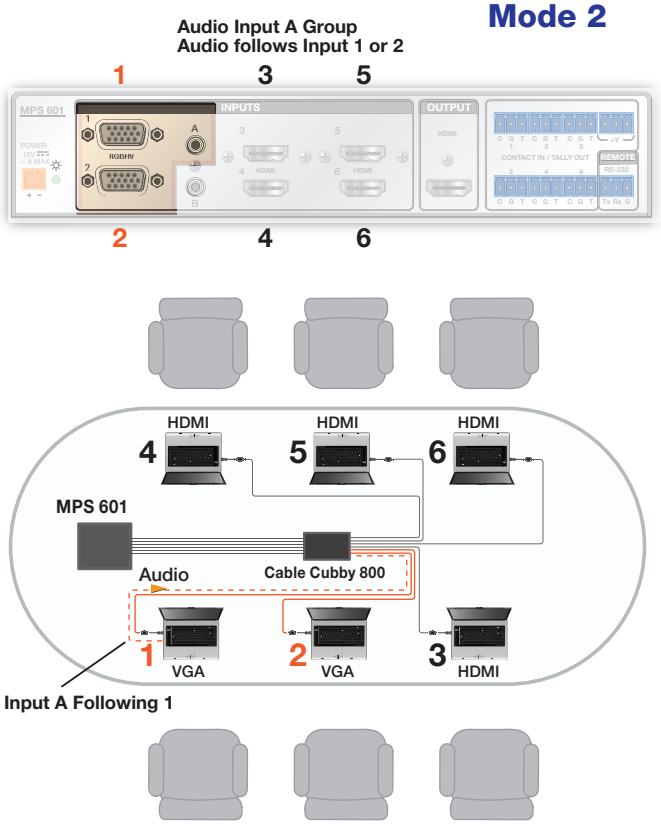


Figure 14. Audio Mode 1 Switching (Default)

Mode 2

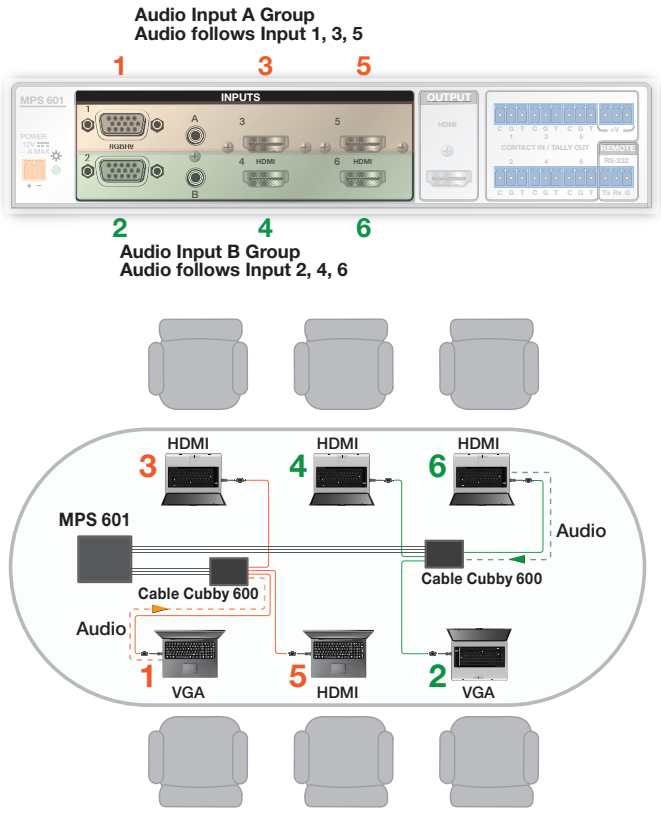


Analog audio input A is grouped with RGBHV inputs 1 and 2.

- Input 1 selected: RGBHV 1 video and audio input A switch to the HDMI output.
- Input 2 selected: RGBHV 2 video and audio input A switch to the HDMI output.
- Audio input B is disabled.
- Inputs 3 through 6 selected: the selected HDMI video and embedded audio switch to the HDMI output.

NOTE: Audio input A and audio input B are analog inputs normally associated with PCs and laptops that output analog video (VGA). Some laptops with digital video output do not include audio on the digital output and require analog audio connections instead.

Mode 3



An HDMI/DVI source requires analog audio.

- Audio input A is grouped with inputs 1, 3, 5.
  Input 1 selected: RGBHV 1 video and audio input A switch to the output.
- When input 3 or input 5 is selected, the selected HDMI video signal switches to the output. If embedded digital audio is present on the selected HDMI input, it switches to the output. If digital audio is not present, analog audio input A switches to the output. Priority selection is embedded digital audio (see **Autodetect for Audio** on page 14).
- Audio input B is grouped with inputs 2, 4, 6.
  Input 2 selected: RGBHV 2 video and audio input B switch to the output.
- When input 4 or input 6 is selected, the selected HDMI video signal switches to the HDMI output. If embedded digital audio is present on the selected HDMI input, it switches to the output. If digital audio is not present, analog audio input B switches to the output. Priority selection is embedded digital audio (see **Autodetect for Audio** on page 14).

Autodetect for Audio

Autodetect for audio is enabled when audio mode 3 is active. Audio InfoFrame data embedded in the digital signal is sampled to determine if audio is present on the selected HDMI stream.

- If audio is present on the incoming stream, it is selected for output.
- If audio is not present on the incoming HDMI stream, audio input A is substituted when video input 3 or video input 5 is selected, or audio input B is substituted when video input 4 or video input 6 is selected is selected (see **Mode 3** on page 13).

Auto-input Switching

Using software control, the switcher can be configured to automatically switch to the highest or lowest input number with active video (see **Input auto switching** on page 24 for SIS control and **Audio Config Page** on page 39 for PCS operation). If the selected input does not have active video, the input is switched according to the selection:

- **`Priority to the highest active input number`** — Automatically switches to the highest numbered input with active video.
- **`Priority to the lowest active input number`** — Automatically switches to the lowest numbered input with active video.

NOTE: When auto-input switching is enabled and if video is absent from **all** inputs, input 1 is selected.

Front Panel Lockout (Executive Mode)

Executive mode provides security from an accidental or unauthorized front panel button press by locking out the input switching buttons.

The RS-232 and USB ports are always accessible regardless of the executive mode state.

To enable executive mode:

- Press and hold input 1 and input 2 for 3 seconds to toggle executive mode on or off.
- All front panel LEDs flash twice to indicate that executive mode is enabled or disabled.

While executive mode is enabled, all front panel LEDs flash twice when any button is pressed.

Reset Mode

To reset the switcher to default settings from the front panel:

- Pull the power connector to remove power from the switcher.
- Press and hold Input 1 on the front panel while connecting power.
- Continue to hold Input 1 until the power up sequence is complete.

EDID Minder

The HDMI and RGBHV input groups feature EDID Minder, ensuring that each input source reads the EDID of the output display even when the input is not selected. The result is the video source powers up properly and reliably outputs content when selected.

Depending on the EDID mode selected, the EDID of the connected display is stored in slot 65 (see **User assigned EDID Mode** on page 16). The user can select an EDID file from the internal list or read the display EDID and store it one of four user slots. Whether stored automatically or manually, the EDID file is written to internal memory for each input.

Automatic Mode

If an output display has never been connected, a default EDID file is placed on the RGB and HDMI inputs according to the following table:

Input Group	Default EDID
RGBHV	1920x1080 @ 60 Hz
HDMI	1080p @ 60 Hz, 2-Ch PCM audio

When a display is connected to the output, the EDID of the display is read and replaces the default EDID on each input. The EDID remains even if the display is removed. If a different display is connected or a user assigned EDID is selected, the previous EDID is overwritten.

User assigned EDID Mode

Using SIS commands, an EDID file can be selected from a table of 64 EDID files. Four additional EDID file locations are reserved for user-loaded EDID files. Once a user assigned EDID is selected, it is stored at that input and EDID polling ceases for a connected display. The following table lists the native resolution of each factory EDID file.

EDID	Native Resolution	Refresh	Rate Type	Video Format	Audio
1	800 x 600	60 Hz	PC	VGA	N/A
2	1024 x 768	60 Hz	PC	VGA	N/A
3	1280 x 720	60 Hz	PC	VGA	N/A
4	1280 x 768	60 Hz	PC	VGA	N/A
5	1280 x 800	60 Hz	PC	VGA	N/A
6	1280 x 1024	60 Hz	PC	VGA	N/A
7	1360 x 768	60 Hz	PC	VGA	N/A
8	1366 x 768	60 Hz	PC	VGA	N/A
9	1400 x 1050	60 Hz	PC	VGA	N/A
10	1440 x 900	60 Hz	PC	VGA	N/A
11	1600 x 900	60 Hz	PC	VGA	N/A
12	1600 x 1200	60 Hz	PC	VGA	N/A
13	1680 x 1050	60 Hz	PC	VGA	N/A
14	1920 x 1080	60 Hz	PC	VGA	N/A
15	1920 x 1200	60 Hz	PC	VGA	N/A
16	2048 x 1080	60 Hz	PC	VGA	N/A
17	800 x 600	60 Hz	PC	DVI	N/A
18	1024 x 768	60 Hz	PC	DVI	N/A
19	1280 x 720	60 Hz	PC	DVI	N/A
20	1280 x 768	60 Hz	PC	DVI	N/A
21	1280 x 800	60 Hz	PC	DVI	N/A
22	1280 x 1024	60 Hz	PC	DVI	N/A
23	1360 x 768	60 Hz	PC	DVI	N/A
24	1366 x 768	60 Hz	PC	DVI	N/A
25	1400 x 1050	60 Hz	PC	DVI	N/A
26	1440 x 900	60 Hz	PC	DVI	N/A
27	1600 x 900	60 Hz	PC	DVI	N/A
28	1600 x 1200	60 Hz	PC	DVI	N/A
29	1680 x 1050	60 Hz	PC	DVI	N/A
30	1920 x 1080	60 Hz	PC	DVI	N/A
31	1920 x 1200	60 Hz	PC	DVI	N/A
32	2048 x 1080	60 Hz	PC	DVI	N/A

EDID	Native Resolution	Refresh	Rate Type	Video Format	Audio
33	800 x 600	60 Hz	PC	HDMI	2-Ch
34	1024 x 768	60 Hz	PC	HDMI	2-Ch
35	1280 x 768	60 Hz	PC	HDMI	2-Ch
36	1280 x 800	60 Hz	PC	HDMI	2-Ch
37	1280 x 1024	60 Hz	PC	HDMI	2-Ch
38	1360 x 768	60 Hz	PC	HDMI	2-Ch
39	1366 x 768	60 Hz	PC	HDMI	2-Ch
40	1400 x 1050	60 Hz	PC	HDMI	2-Ch
41	1440 x 900	60 Hz	PC	HDMI	2-Ch
42	1600 x 900	60 Hz	PC	HDMI	2-Ch
43	1600 x 1200	60 Hz	PC	HDMI	2-Ch
44	1680 x 1050	60 Hz	PC	HDMI	2-Ch
45	1920 x 1200	60 Hz	PC	HDMI	2-Ch
46	2048 x 1080	60 Hz	PC	HDMI	2-Ch
47	480p	60 Hz	HDTV	HDMI	2-Ch
48	576p	50 Hz	HDTV	HDMI	2-Ch
49	720p	50 Hz	HDTV	HDMI	2-Ch
50	720p	60 Hz	HDTV	HDMI	2-Ch
51	1080i	50 Hz	HDTV	HDMI	2-Ch
52	1080i	60 Hz	HDTV	HDMI	2-Ch
53	1080p	50/25 Hz	HDTV	HDMI	2-Ch
54	1080p	50 Hz	HDTV	HDMI	2-Ch
55	1080p	60/24 Hz	HDTV	HDMI	2-Ch
56	1080p	60 Hz	HDTV	HDMI	2-Ch
57	720p	50 Hz	HDTV	HDMI	Multi-Ch
58	720p	60 Hz	HDTV	HDMI	Multi-Ch
59	1080i	50 Hz	HDTV	HDMI	Multi-Ch
60	1080i	60 Hz	HDTV	HDMI	Multi-Ch
61	1080p	50/25 Hz	HDTV	HDMI	Multi-Ch
62	1080p	50 Hz	HDTV	HDMI	Multi-Ch
63	1080p	60/24 Hz	HDTV	HDMI	Multi-Ch
64	1080p	60 Hz	HDTV	HDMI	Multi-Ch
65	Output (autodetect)				
66	User loaded slot 1				
67	User loaded slot 2				
68	User loaded slot 3				
69	User loaded slot 4				

NOTES:

- The inputs are loaded with a default EDID. VGA inputs 1 and 2 have EDID 14 and digital inputs 3 to 6 have EDID 56.
- **2-Ch** supports: 2-Ch LPCM audio
- **Multi-Ch** supports: 2-Ch LPCM, 8-Ch LPCM, all Dolby Digital formats and all DTS formats

Remote Communication and Control

This section discusses SIS programming and control of the MPS 601 including:

- **Connection Options**
- **Host-to-MPS Communications**
- **Command and Response Table**

Connection Options

The MPS 601 can be remotely connected to a host computer or other device (such as a control system) attached to the rear panel RS-232 port or the front panel USB Config port.

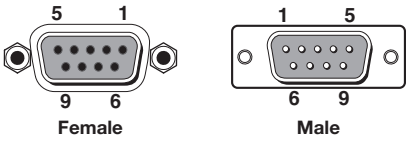
The switcher can be set up and controlled using Simple Instruction Set (SIS) commands. SIS commands are executed using the Extron DataViewer program, found at **www.extron.com**.

Remote Control Port (RS-232)

The RS-232 port connector (see **figure 2**, Ⓗ on page 4) connects to a host or external controlling device, such as a computer or control system, which can generate the proper command codes and recognize switcher responses.

The RS-232 connector on the PC is a 9-pin D female with the following pin designations:

Pin	RS-232 Function	Description
1	-	No connection
2	Tx	Transmit data
3	Rx	Receive data
4	-	No connection
5	Gnd	Signal ground
6,7	-	No connection
8,9	-	No connection



The protocol for the serial port is: 9600 baud, no parity, 8 data bits, 1 stop bit, no flow control. Commands and responses for programming the MPS 601 from a host system connected to the RS-232 or USB port are listed later in this chapter.

Front Panel Configuration Port

The USB mini B port is located on the front panel (see figure 15, below). It is used to connect to a host computer for configuration using SIS commands with DataViewer or for updating firmware with the Firmware Loader utility. Both are available at **www.extron.com**. It may be necessary to install the USB driver to the connected computer.

To connect the MPS 601 to a host computer:

> **NOTE:** If an Extron USB device has never been connected to the host computer, prior to connecting the MPS 601 Config (USB) port for the first time, you must install and activate the USB driver. The simplest way to do this is to install either DataViewer (see **DataViewer** on page 47) or the Firmware Loader utility (see **Updating Firmware** on page 48).

1. After the USB driver is loaded, connect a USB A to mini B cable between the Config port on the MPS 601 front panel and a USB port of the PC.

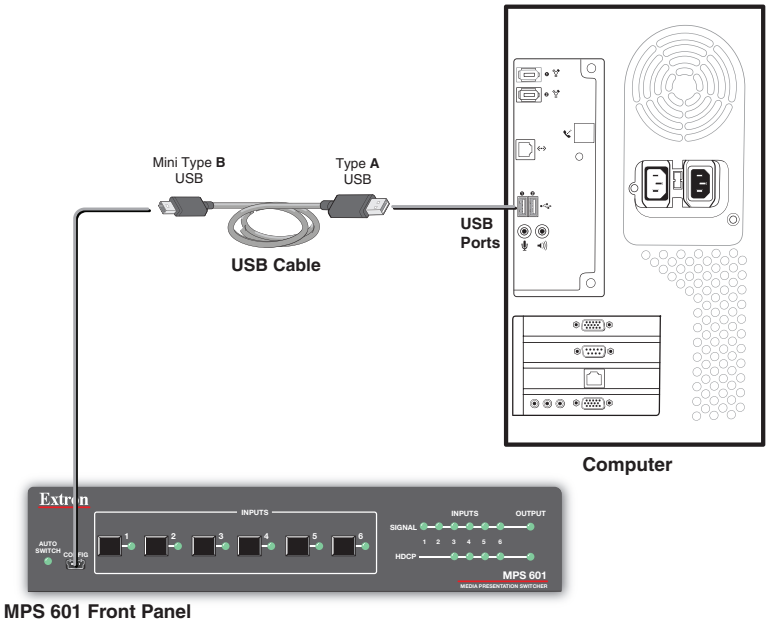


Figure 15. Connecting a PC to the MPS 601 Front Panel USB Port

2. If this is the first time an Extron product is connected to the PC, the Found New Hardware Wizard dialog opens. The first screen offers to connect to Windows Update to search for the appropriate driver. This is not necessary if the USB driver is already on your PC (see the Note above).

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site [with your permission].
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
2
Click Next to continue
3
< Back
Next >
Cancel

Figure 16. Found New Hardware Wizard

Select **`No, not this time`** if the driver is already on the PC (see the Note above).

3. Click **Next**.

   The following dialog opens:

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This Wizard helps you install software for:
Extron USB Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
4
Install the software automatically [Recommended]
Install from a list or specific location [Advanced]
Click Next to continue
5
< Back
Next >
Cancel

Figure 17. Install the Software Automatically

4. Select **Install the software automatically (Recommended)**.

   NOTE: You do not need to insert an installation disc.

5. Click **Next**.

   The PC locates the driver and installs it.

   NOTE: The wizard opens only on the first occasion you connect the MPS 601 to a USB port. The wizard reopens only if you connect the MPS 601 to a different USB port or if you connect a different piece of equipment, requiring a different driver, to the same USB port.

6. When the **Completed** dialog opens, click **Finish** to close the wizard.
7. Configure the MPS 601 as required.

Host-to-MPS Communications

The MPS switcher accepts Simple Instruction Set (SIS) commands through the RS-232 or USB configuration port. SIS commands consist of one or more characters per command field. They do not require special characters to begin or end the command character sequence. Each response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

MPS Switcher-initiated Messages

When a local event occurs, such as a front panel operation, the MPS switcher responds by sending a message to the host. The MPS 601-initiated messages are listed below (underlined).

Boot-up messages

(c) Copyright 2Ønn, Extron Electronics, MPS 6Ø1, Vx.xx,nn-nnnn-nn ↵

The copyright message is initiated by the switcher when it is first powered on. *Vx.xx* is the firmware version number.

Status change messages

The switcher-initiated status change messages are a result of front panel operations (actual or software-simulated). The status change messages are the same as switcher responses to certain commands. See the last column of the command and response tables on the following pages.

MPS Switcher Error Responses

When the MPS switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, it returns an error response to the host. The error response codes are:

EØ1 ↵ — Invalid input channel number (too large)

EØ6 ↵ — Invalid switch command (due to auto-input switch enabled)

E1Ø ↵ — Invalid command

E13 ↵ — Invalid parameter (out of range)

E14 ↵ — not valid for this configuration

E17 ↵ — Invalid command for signal type

E22 ↵ — busy

Command and Response Table

Using the Command and Response Table

The command and response table is shown on the following pages. Lower case characters are acceptable in the command field only where indicated. Symbols are used throughout the table to represent variables in the command and response fields. Symbol definitions and an ASCII-to-hexadecimal (HEX) conversion table are shown below. Command and response examples are shown throughout the command and response table.

Symbol definitions

- ↵ = CR/LF (carriage return/line feed) (hex ØD ØA).
- ← = Carriage return (no line feed, hex ØD).
- | = Pipe (vertical bar) character
- • = Space character in command or response (all other spaces shown are for clarity).
- W Can be used interchangeably with the Esc character
- Esc = Escape key (hex 1B)
- X1 = Inputs Ø through 6 for single input addressing (Ø = de-select)
- X3 = Status
  Ø = off (disable), (default)
  1 = on (enable)
- X4 = Video output color bit depth
  Ø=Auto (based on EDID), (default)
  1=force 8-bit
- X5 = Signal Status
  Ø=no signal
  1=signal present.
- X6 = HDCP authorized status
  Ø=block/disable HDCP encryption.
  1=Allow/Enable HDCP encryption (default).
- X7 = EDID slot number from lookup table (see **User assigned EDID Mode** on page 16):
  1-64 = factory EDIDs,
  65 = Output (autodetect),
  66-69 = user loaded EDID slots.
- X8 = Native resolution and refresh rate from EDID.
- X9 = Firmware version, Example: 1.ØØ
- X10 = Firmware and build version, Example: 1.ØØ.ØØØ1
- X14 = Executive mode
  Ø=unlocked/disabled (default)
  1=locked/enabled
- X15 = Audio mode
  1 = Audio input A follows input 1. Audio input B follows input 2 (default).
  2 = Audio input A follows inputs 1 and 2. Audio input B is disabled.
  3 = Audio input A is grouped to inputs 1, 3, 5. Audio input B is grouped to inputs 2, 4, 6.
- X16 = Auto input switching mode
  Ø = disabled, manual switching (default).
  1 = on/enabled, priority to the highest active input.
  2 = on/enabled, priority to the lowest active input.
- X17 = AV mute mode
  Ø=normal operation (no mute, default).
  1=Enable AV mute by contact input.

X18 = Mute LED mode
Ø = Always on (default).
1 = Off, when muted.
2 = Blink, when muted.

X19 = Name is a text string of up to 24 alpha-numeric characters and a minus sign or hyphen (-). No blank or space characters are permitted. No distinction between upper and lower case. The first letter must be a letter, and the last character must not be a minus sign or hyphen.
Default: MPS-6Ø1.

X30 = Pixel phase
Ø to 63 (default=32)

X31 = Total Pixels
±255 of the default value depending on input rate.

X32 = Horizontal start
Ø to 255 (default=128)

X33 = Vertical start
Ø to 255 (default=128)

X34 = HDCP status
Ø=not connected
1=HDCP encrypted
2=not HDCP encrypted

Command and response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Description
Input selection			
Select input	X1 !	In X1 • All ↵	Select input X1 audio and video.
View current input	!	X1 ↵	View active input X1.
View all inputs and output status	Esc ØLS ←	Sig X5 • X5 • X5 • X5 • X5 • X5 * X5 ↵	Each X5 variable represents one video input from 1 to 6 plus the output Ø=no signal 1=signal present
AV Mute (from contact and tally pins)			
Configure video mute	Esc X17 * X18 MUTM ←	Mutm X17 * X18 ↵	
NOTE: 0*1 and 0*2 are invalid combinations (E13 response)			
Video mute			
Video mute	1B	Vmt1 ↵	
Video unmute	ØB	VmtØ ↵	
View video mute status	B	X3 ↵	
Audio mute			
Audio mute	1Z	Amt1 ↵	Mute HDMI embedded audio
Audio unmute	ØZ	AmtØ ↵	
View audio mute status	Z	X3 ↵	
Audio input mode			
Set input audio mode	Esc X15 AMOD ←	AmodI X15 ↵	
View input audio mode	Esc AMOD ←	X15 ↵	
Input auto switching			
Disable input auto switch	Esc ØAUSW ←	AuswØ ↵	Manual input switching (default)
Priority to highest active input	Esc 1AUSW ←	Ausw1 ↵	
Priority to lowest active input	Esc 2AUSW ←	Ausw2 ↵	
View input auto switch setting	Esc AUSW ←	X16 ↵	
Video output			
Set video color bit depth	Esc V X4 BITD ←	BitdV X4 ↵	
View color bit depth	Esc VBITD ←	X4 ↵	

NOTES:
- X1 = Inputs Ø through 6 for single input addressing (Ø = de-select)
- X3 = Status — Ø= off/disabled, 1= on/enabled
- X4 = Video output color bit depth — Ø=Auto (based on EDID); 1=force 8-bit
- X5 = Signal status — Ø= no signal, 1= signal present
- X17 = AV mute mode — Ø=normal operation (no mute, default); 1=Enable video and audio mute, 1=Enable video mute
- X18 = Mute LED mode — Ø = Always on (default); 1 = Off, when muted; 2 = Blink, when muted
- X15 = Audio mode — 1= Audio input A follows input 1. Audio input B follows input 2 (default). 2= Audio input A follows input 1 or input 2. Audio input B is disabled. 3= Audio input A is grouped to inputs 1, 3, 5. Audio input B is grouped to inputs 2, 4, 6.
- X16 = Autoswitch mode — Ø=Disabled (default); 1=Enabled, highest active input has priority; 2=Enabled, lowest active input has priority

Command	ASCII Command (host to switcher)	Response (switcher to host)	Description
Picture Adjustments (RGB Inputs only)			
NOTE: The specific input must be selected on the front panel in order to make picture adjustments.			
Set pixel phase	Esc X1 * X30 PHAS ←	Phas X1 * X30 ↵	Set input X1 to pixel phase X30
Increment pixel phase value	Esc X1 + PHAS ←	Phas X1 * X30 ↵	Increment pixel phase of input X1
Decrement pixel phase value	Esc X1 - PHAS ←	Phas X1 * X30 ↵	Decrement pixel phaseof input X1
View pixel phase value	Esc X1 PHAS ←	X30 ↵	View pixel phase X30 of input X1
Set total pixels value	Esc X1 * X31 TPIX ←	Tpix X1 * X31 ↵	Set total pixels X31 of input X1.
Increment total pixels value	Esc X1 + TPIX ←	Tpix X1 * X31 ↵	Increment the total pixels X31 for input X1 by one pixel.
Decrement total pixels value	Esc X1 - TPIX ←	Tpix X1 * X31 ↵	Decrement the total pixels X31 for input X1 by one pixel.
View total pixels value	Esc X1 TPIX ←	X31 ↵	View total pixels X31 for input X1.
Set horizontal start value	Esc X1 * X32 HSRT ←	Hsrt X1 * X32 ↵	Set the horizontal start value X32 for input X1.
Increment horizontal start value	Esc X1 + HSRT ←	Hsrt X1 * X32 ↵	Increment the horizontal start value X32 for input X1 by one pixel.
Decrement horizontal start value	Esc X1 - HSRT ←	Hsrt X1 * X32 ↵	Decrement the horizontal start value X32 for input X1 by one pixel.
View horizontal start value	Esc X1 HSRT ←	X32 ↵	View the horizontal start value X32 of input X1.
Set vertical start value	Esc X1 * X33 VSRT ←	Vsrt X1 * X33 ↵	Set the vertical start value X33 for input X1.
Increment vertical start value	Esc X1 + VSRT ←	Vsrt X1 * X33 ↵	Increment the vertical start value X33 for input X1 by one line.
Decrement vertical start value	Esc X1 - VSRT ←	Vsrt X1 * X33 ↵	Decrement the vertical start value X33 for input X1 by one pixel.
View vertical start value	Esc X1 VSRT ←	X33 ↵	View the vertical start value X33 of input X1.

NOTES:

X1 = Input number	1 or 2 for single input addressing, Ø=muted (RGB only).
X30 = Pixel phase	Ø to 63 (default=32).
X31 = Total pixels	±255 of default value depending on input rate.
X32 = Horizontal start	Ø to 255 (default=128).
X33 = Vertical start	Ø to 255 (default=128).

Command	ASCII Command (host to switcher)	Response (switcher to host)	Description
HDCP Management			
Set HDCP authorization per input	Esc E X1 * X6 HDCP ←	HdcpE X1 * X6 ↵	X1 = HDMI inputs 3-6 only
Set HDCP authorization all inputs	Esc E X6 HDCP ←	HdcpE X6 ↵	X6 = Ø=blocked 1=enabled/on (default)
View HDCP status	Esc E HDCP ←	HdcpE X6 • X6 • X6 • X6 ↵	See Notes below.
View input HDCP status	Esc I X1 HDCP ←	HdcpI X34 ↵	See Notes below.
View output HDCP status	Esc O HDCP ←	HdcpO X34 ↵	See Notes below.
View HDCP status for all inputs	Esc I HDCP ←	HdcpL X34 • X34 • X34 • X34 ↵	Inputs 3 through 6 in order.
Front panel security lockout (executive mode)			
Lock front panel access	1X	Exe1 ↵	Locks front panel.
Unlock front panel access	ØX	ExeØ ↵	Unlocks all front panel controls.
View Lock Status	X	X14 ↵	Lock status: Ø=unlocked 1=locked
System reset (to factory defaults)			
Reset switcher to factory defaults	Esc ZXXX ←	Zpx ↵	Resets the system to the factory defaults.
Naming commands			
Set the unit name	Esc X19 CN ←	Ipn • X19 ↵	
Return the unit name to default	Esc • CN ←	Ipn•MPS-6Ø1 ↵	
View unit name	Esc CN ←	X19 ↵	

NOTES:

X1 = Input number	3 to 6 for HDMI input addressing, Ø=deselected.
X6 = HDCP authorized status	Ø= Block, 1=Allow (default).
X14 = Executive mode status	Ø=unlocked/disabled (default) 1=locked/enabled
X19 = Device Name	Default: MPS-6Ø1. Name is a text string of up to 24 alpha-numeric characters and a minus sign or hyphen (-). No blank or space characters are permitted. No distinction between upper and lower case. The first letter must be a letter, and the last character must not be a minus sign or hyphen.
X34 = HDCP status	Ø=not connected. 1=HDCP encrypted. 2=not HDCP encrypted.

Command	ASCII Command (host to switcher)	Response (switcher to host)	Description
Information request			
General information	I	In[X1]AflwØ•Ausw[X15]•Vmt[X3]•Amt[X3]↵	Video input (1-6), Audio input (1-6), Autoswitch status, Video mute status, Audio mute status.
Query model name	1I	MPS•6Ø1↵	
Query part number	N	6Ø-*xxxx-xx*↵	6Ø-1337-Ø1
Query Firmware version			
Query firmware version	Q/q	x.xx↵	Displays firmware version number to the second decimal.
Query firmware version with build	*Q/q	x.xx.xxxx↵	Displays firmware version and build number to the fourth decimal.
EDID Minder			
Assign EDID to specific input	[Esc]A[X1]*[X7]EDID←	EDIDA[X1]*[X7]↵	[X7] = 1 to 64
View EDID assignment	[Esc]A[X1]EDID←	[X7]↵	[X7] = 1 to 69
Save display EDID to user location	[Esc]S[X7]EDID←	[X7]↵	[X7] = 66 to 69
View/Read EDID of input in hex format	[Esc]R[X1]EDID←	[X20]↵	Read HEX data (as text) from currently selected EDID.
View EDID native resolution	[Esc]N[X1]EDID←	[X8]↵	Read native resolution and refresh rate from currently selected EDID. **Example:** 1920x1200@60Hz

NOTES:

- [X1] = Video Input — 1 to 6 for single input addressing, Ø=deselected.
- [X3] = Mute status — Ø= off/disabled, 1=on/enabled
- [X7] = EDID memory slot number — From lookup table (see **User assigned EDID Mode** on page 16):
  1-64 = factory EDIDs,
  65 = Output (autodetect),
  66-69 = user loaded EDID slots.
  Default: Video inputs 1 and 2=14
  Video inputs 3 to 6=56.
- [X8] = Native resolution and refresh rate from EDID
- [X20] = EDID hex value — EDID raw hex value: 128 or 256 Byte (text form)

Configuration Software

The Extron Product Configuration Software (PCS) provides a graphical user interface that includes the same functions as those on the front panel and provides an additional way to configure the MPS 601 using a USB or RS-232 connection.

This section describes the software installation and operation. Topics include:

- **Installing the Software**
- **Starting the Software**
- **Using the Software**
- **Navigating the PCS Application**
- **Configuration Pages**
- **Hardware Pages**

The control software (available on the Extron **website**) is compatible with Microsoft Windows operating systems.

Installing the Software

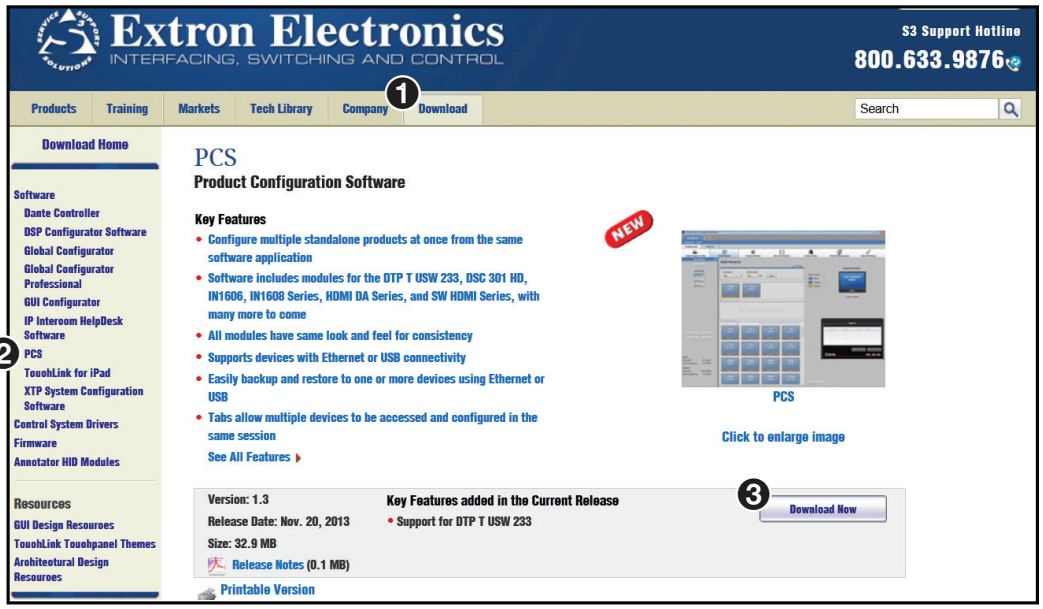


Figure 18. PCS Download from the Extron Website

1. On the Extron website, select the **Download** tab.
2. From the left sidebar, click the **PCS** link.
3. Click **Download Now**.
4. Submit required information to start the download. Note where the file is saved.
5. Open the executable (.exe) file from the save location.
6. Follow the instructions on the screen. By default, the installation creates a directory in the Program Files or Program Files (x86) folder.

Starting the Software

Open the Product Configuration Software program from the **Start** menu or desktop shortcut. The software window opens with the **Connect to Online Device** tab open.

NOTE: The **Start New Device File**, which starts the PCS program in emulate mode, is not functional for the MPS 601. Always use the **Connect to Online Device** tab to connect.

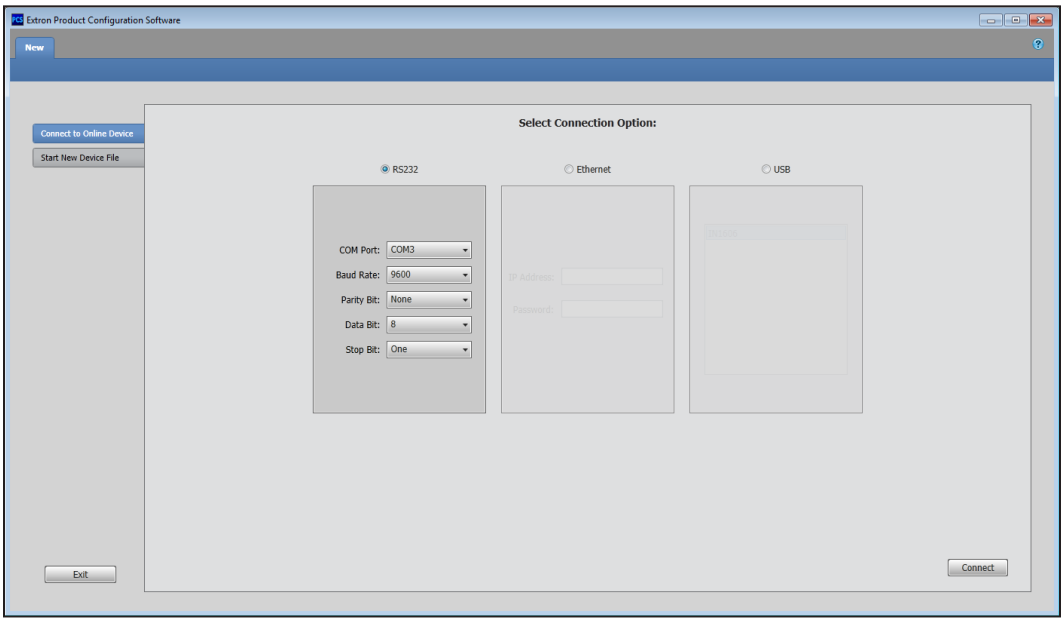


Figure 19. Device Selection Window

Connect to Online Device

The **Connect to the Online Device** tab connects the software to a specified device.

1. Click the **Connect to Online Device** tab.
2. From the **Select Connection Option:** panel, select one of the following to choose the connection option:
   - **RS232** — Select the **RS-232** radio button if the device is connected to the host device through an RS-232 connection.

     Configure the port using the drop-down lists (see **Remote Control Port (RS-232)** on page 18).

     NOTE: The default settings are shown.

   - **USB** — Select the **USB** radio button if the device is connected to the host device with the front panel mini-USB connection. Select the desired device from the list of connected devices (see **Front Panel Configuration Port** on page 19).

   NOTE: Although the Ethernet option is listed, the MPS 601 does not have an Ethernet port to support connection.

3. Click **Connect**. The configuration page opens (see **Using the Software** on page 30) and the device is ready for configuration.

Using the Software

The main PCS window opens on the Configuration page and the Input/Output Config panel selected. Under the device tab, PCS has two drop-down menus on the toolbar: **Connections** and **Tools** (see figure 21).

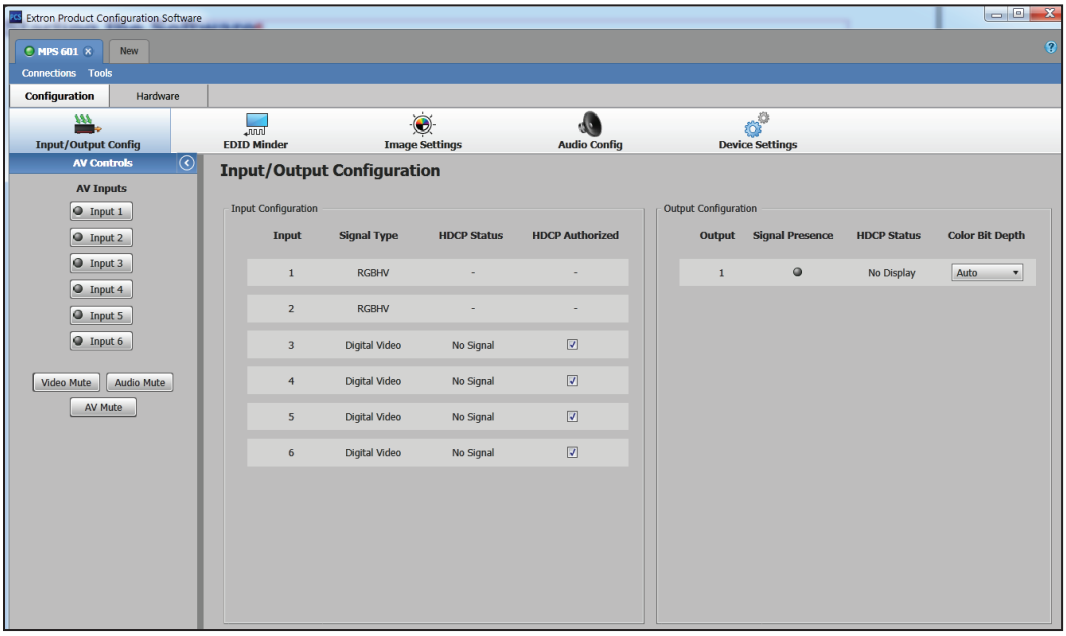


Figure 20. New Device Page

Connections Menu

The **Connections** menu contains options for connecting, disconnecting, and exiting the program. In the toolbar, click **Connections** below the device tab.

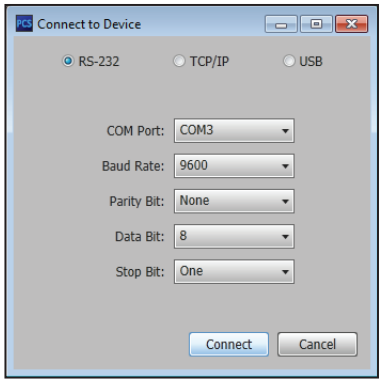
Figure 21. Connections Menu (MPS 601)

Connect

If the connection to the MPS 601 has not been made, use the following to connect. The **Connect** indicator is grayed when the MPS 601 is connected.

NOTE: If a device is already connected, the **Connect** option is disabled until the device is disconnected or the connection times out.

1. From the toolbar, select **Connections>Connect**. The **Connect to Device** dialog opens (shown at right).
2. Select the connection method from the options (see **Connect to Online Device** on page 29).
3. Click **Connect** in the bottom right corner to connect to the device.



Disconnect

This option disconnects the PCS program from the device.

From the **Connections** menu, click **Disconnect**. The MPS 601 is disconnected but the PCS program remains open.

NOTE: If a device is already disconnected, the **Disconnect** option is disabled until the device is connected.

Exit

This option disconnects the MPS 601 (if connected) and closes the application.

From the toolbar select **Connections > Exit**. The application closes.

Tools Menu

The **Tools** menu contains the update firmware option. To access this menu from the toolbar, click **Tools**.

Figure 22. Tools Menu

Update Firmware

This option uploads firmware from the host device to the connected device.

NOTE: If necessary, download new firmware from the Extron website (see **Download the latest firmware file:** on page 48).

1. From the toolbar, select **Tools > Update Firmware**. The initial Update Firmware dialog box opens asking permission to disconnect from the device.

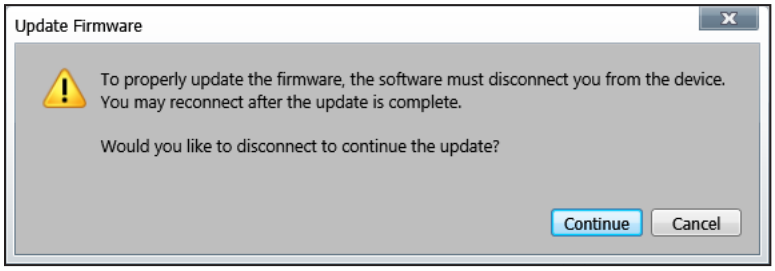

Update Firmware
To properly update the firmware, the software must disconnect you from the device.
You may reconnect after the update is complete.
Would you like to disconnect to continue the update?
Continue
Cancel

Figure 23. Update Firmware Dialog Box

2. Click **Continue** to disconnect from the device and continue the firmware update. The Update Firmware browser opens.

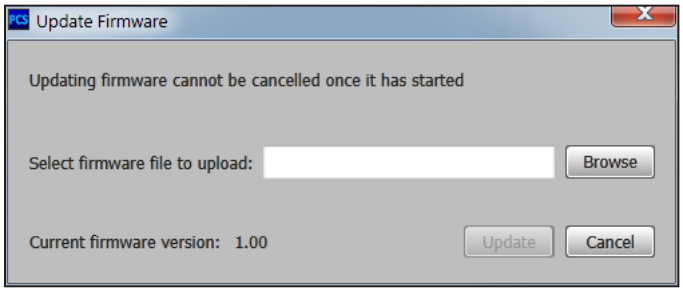


Figure 24. Update Firmware Browser

3. Click **Browse** (see figure 24 on the previous page).
4. Navigate to the desired firmware file and select the device-specific firmware file. Valid firmware files have an .eff or .esf file extension.
5. Click **Open**. This returns you to the Update Firmware dialog box.
6. In the Update Firmware dialog box, click **Update**. A progress bar shows the progress of the firmware upload to the device.

Navigating the PCS Application

The configuration software opens to two main tabs: **Configuration** and **Hardware**.

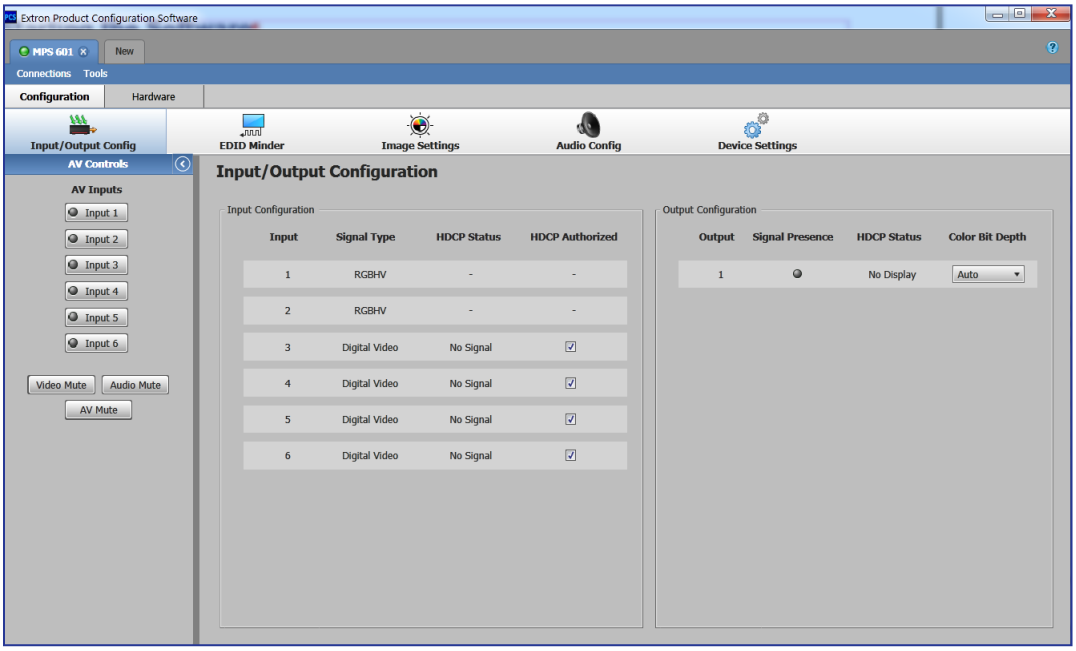


Figure 25. Product Configuration Software - Main Screen

Click a tab to change the global navigation bar with icons that open various pages for configuration settings and information (see figures 26 and 27 below for available pages on the configuration and the hardware tabs).

Figure 26. Configuration Global Navigation Bar

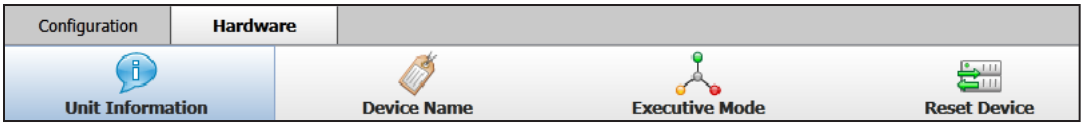


Figure 27. Hardware Global Navigation Bar

Each page is divided into the AV Controls panel (which is always present), and a panel with details of the selected configuration page.

AV Controls Panel

The AV Controls panel (see figure 25, on left) selects between the connected input sources and also can mute output audio, video, or both. The appropriate mute button turns red to indicate a muted source (audio is muted in figure 28). Click a red mute button to unmute the source. The button returns to gray.

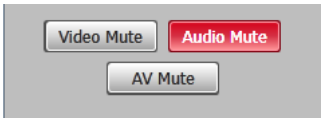


Figure 28. AV Controls Panel Mute Buttons

NOTE: The AV controls panel can be hidden or revealed on any page by clicking on the arrow button at the top right of the panel.

Configuration Pages

The Configuration tab global navigation bar has the following pages:

- **Input/Output Configuration** – Provides an overview of the current inputs and output configuration (see **Input/Output Configuration** on page 34).
- **EDID Minder** – Provides a list of EDIDs and their current assignments and allows changing them (see **EDID Minder Page** on page 36).
- **Image Settings** – RGBHV inputs only, provides configuration for the analog inputs to optimize them for scaling (see **Image Settings Page** on page 38).
- **Audio Config** – Select the mode of operation for the audio inputs (see **Audio Config Page** on page 39).
- **Device Settings** – Selects the priority of auto input switching and sets the tally out LED indicator (see **Device Settings Page** on page 40).

In addition the AV Controls panel is always present.

Input/Output Configuration

Input Configuration panel

The Input/Output Configuration panel shows the current status of all inputs and the output. In the **AV Controls** panel click an input to select it for configuration.

NOTE: The signal indicator in the AV controls panel lights green when a signal is present on the corresponding input or orange when there is no signal present.

- **Input** – This number corresponds to the input number on the rear panel.
- **Signal Type** – Indicates the source signal type.
  - RGBHV – The input is an analog signal.
  - Digital Video – The input is an HDMI or DVI signal.
- **HDCP Status** – This column indicates the HDCP signal status for the digital inputs (3-6) only.
- **HDCP Authorized (inputs 3 to 6 only)** – Select the **HDCP Authorized** check box to have the input report as an HDCP authorized device. If the box is not checked the source is blocked from encrypting its output. This may result in content not passed to the output.

  NOTE: This option is not available for analog inputs 1 and 2.

  This feature influences the ability of a digital input to report as an HDCP authorized sink to a source. Some sources encrypt their output even if the source material does not require HDCP encryption, preventing content from being displayed on a non-HDCP compliant display. If that happens, the display mutes the video output to black or displays a warning message.

Output Configuration panel

The Output Configuration panel shows the current status of the output and allows color bit depth adjustment.

- **Output** – The number is always 1.
- **Signal Presence** – Indicates an active signal on the output. Corresponds to the front panel output LED (see **Front Panel Features** on page 11).
- **HDCP Status** – Indicates the HDCP authorization of the output. Corresponds to the front panel HDCP LED (see **Front Panel Features** on page 11).
- **Color Bit Depth** – Allows manual adjustment of the color bit depth:
  - **Auto** – The output color depth is based on the selected output format.
  - **Force 8-bit** – Forces the output color depth to 8-bit.

EDID Minder Page

EDID Minder manages the EDID information between the switcher and one or more input sources. Click the EDID Minder icon on the Global Navigation Bar to open the page.

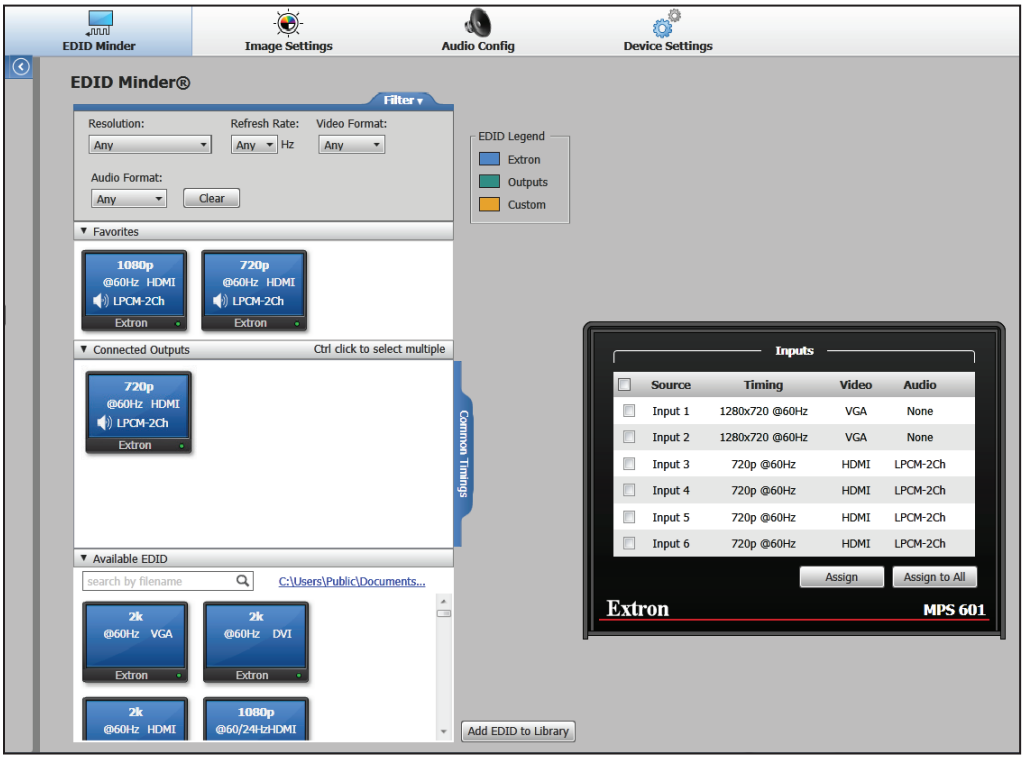


Figure 29. EDID Minder Page

The EDID Minder page is divided into five panels:

- **Filter** – Select from the drop-down lists in each category to limit the EDIDs shown in the three EDID screens.
- **Favorites** – Drag and drop frequently used EDIDs from the Available EDID panel below.
- **Connected Outputs** – Displays the EDID of the currently connected output.
- **Available EDID** – Displays the current list of EDID files available for assignment.
- **Inputs** – Use this panel to assign an EDID or change a current EDID assignment.

Inputs

The EDID properties currently assigned to each of the six inputs are displayed in the table of inputs on the right side of the EDID Minder page. The audio input format listed in an EDID (unless a custom EDID is used) is determined by the audio input format selected on the audio configuration page (see **Audio Config Page** on page 39).

Available EDID panel

EDID can be stored or imported as custom EDID files. Up to four custom EDID files can be stored in the switcher. Audio settings from custom EDID files take priority over current settings on the input.

Audio Format	Audio from EDID
None	No audio
Analog	No audio
LPCM-2Ch	2-channel audio
Multi-Ch	Multi-channel audio
LPCM-2Ch Auto	2-channel audio
Multi-Ch Auto	Multi-channel audio

NOTE: If an analog custom EDID file is assigned to a digital input or a digital custom EDID file assigned to an analog input, the display may not appear correctly.

Filtering Available EDID

Use the Filter panel to limit the number of available EDID displayed in the Favorites, Connected Outputs, and Available EDID panels.

Select a filter from any or all of the available filters.

- From the **Resolution** drop-down menu, select a specific resolution (default: **Any**).
- From the **Refresh Rate** drop-down menu, select a specific refresh rate (default: **Any**).
- From the **Video Format** drop-down menu, select **HDMI**, **DVI**, **VGA**, or **Any**.
- From the **Audio Format** drop-down list, select **multi-Ch**, **LPCM-2Ch**, **None**, or **Any**.

Click **Clear** to set all filters back to **Any**.

Assigning EDID

To assign EDID to selected inputs:

1. From the Inputs panel (table of inputs) on the right, select the check box (or multiple check boxes) for the desired inputs.
2. From the Favorites, Connected Outputs, or Available EDID panel on the left, select the desired EDID. The selection highlights.
3. From the Inputs panel, click **Assign** to place the EDID on the selected input or inputs.

To assign an EDID to all inputs:

1. From the Favorites, Connected Outputs, or Available EDID panel on the left, select an EDID.
2. From the Inputs panel on the right, click **Assign to All**.

NOTE: Checked or unchecked inputs are ignored and the EDID is assigned to all inputs.

To match the selected inputs to the current output resolution:

Matching the output resolution is the default value for all inputs.

Adding EDID to the EDID Library

1. Click **Add EDID to Library**. The **Browse Add EDID to Library** dialog box opens.
2. Navigate to the desired EDID file location and select it.

   NOTE: Valid EDID files have a .bin file extension.

3. Click **Open**. The EDID is added to the Available EDID list.

Image Settings Page

From this page, signal sampling and picture control settings for the two analog inputs (inputs 1 and 2) are adjusted. Click the **Image Settings** icon on the Global Navigation Bar to open the Image Settings page.

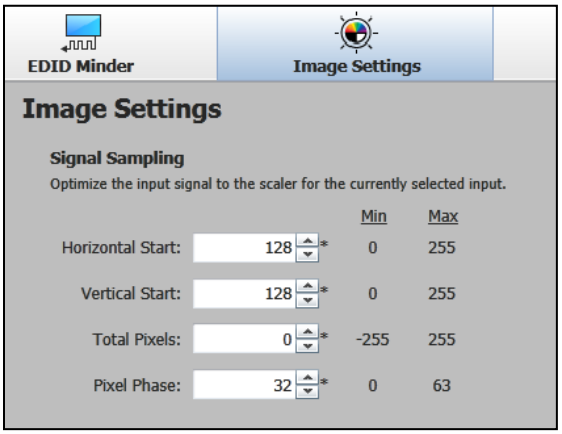

EDID Minder
Image Settings
Image Settings
Signal Sampling
Optimize the input signal to the scaler for the currently selected input.
Min
Max
Horizontal Start: 128 * 0 255
Vertical Start: 128 * 0 255
Total Pixels: 0 * -255 255
Pixel Phase: 32 * 0 63

Figure 30. Image Settings Page

Signal Sampling

To optimize signal sampling settings, select the analog input. Enter a value within the Min and Max values displayed to the right of each adjustable setting or click the **Up** or **Down** arrows.

NOTE: An asterisk beside a chosen value for a signal sampling setting indicates it is the default value for the applied video signal.

Horizontal Start – Defines the number of pixels from the start of the horizontal line where active video begins.

Vertical Start – Defines the number of lines from the start of the vertical line where active video begins.

Total Pixels – The total number of pixels in a horizontal line, including blanking on both sides of the active video area (active video, horizontal sync width, back porch, and front porch). The default value is determined by the source input. Values are adjusted from the default value by ±255.

Pixel Phase – The timing of digital sampling by the scaler. Sampling at the optimum pixel phase results in a bright, stable output and maximizes the contrast between pixels. A good image for phase adjustment has adjacent black and white pixels.

Audio Config Page

The MPS 601 audio inputs have three modes that switch the active digital and analog audio inputs to the output.

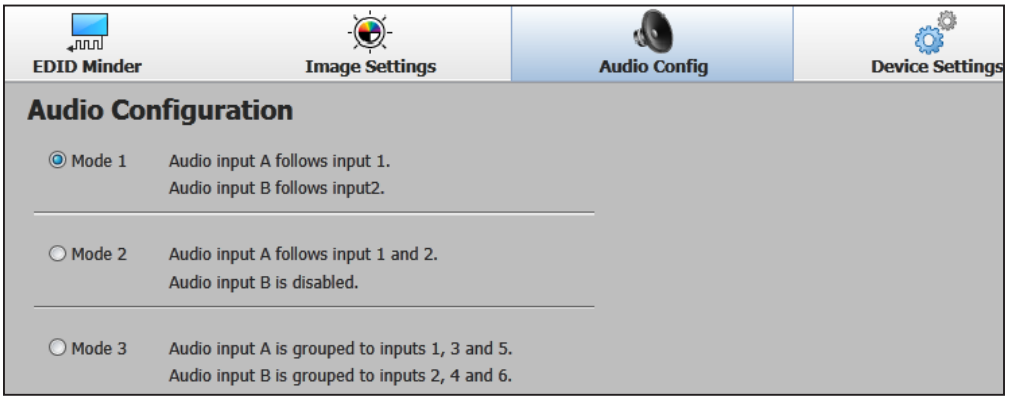

EDID Minder
Image Settings
Audio Config
Device Settings
Audio Configuration
Mode 1
Audio input A follows input 1.
Audio input B follows input2.
Mode 2
Audio input A follows input 1 and 2.
Audio input B is disabled.
Mode 3
Audio input A is grouped to inputs 1, 3 and 5.
Audio input B is grouped to inputs 2, 4 and 6.

Figure 31. Audio Configuration

Audio Configuration

Mode 1 (default) – The associated audio input follows the selected input.

- Audio input A follows input 1.
  When input 1 is selected, RGBHV 1 video and audio input A are routed to the HDMI output.
- Audio input B follows input 2.
  When input 2 is selected, RGBHV 2 video and audio input B are routed to the HDMI output.
- When inputs 3, 4, 5, or 6 are selected, the embedded audio of the selected input is routed to the HDMI output.

Mode 2 – Audio input A is grouped with the analog inputs.

- When input 1 or input 2 is selected, video from the selected input and audio from audio input A is routed to the HDMI output.
- Audio input B is disabled.
- When inputs 3, 4, 5, or 6 are selected, the selected HDMI video and embedded audio is routed to the HDMI output.

Mode 3 – Audio input A is grouped with inputs 1, 3, and 5. Audio input B is grouped with inputs 2, 4, and 6.

- When input 1 is selected, the selected video and audio input A are routed to the output.
- When input 2 is selected, the selected video and audio input B are routed to the output.
- When input 3 or input 5 is selected, the selected HDMI video signal is routed to the output. If embedded digital audio is present on the HDMI input, it is routed to the output. If no digital audio is present, audio input A is routed to the output.
- When input 4 or input 6 is selected, the selected HDMI video signal is routed to the HDMI output. If embedded digital audio is present on the selected HDMI input, it is routed to the output. If no digital audio is present, audio input B is routed to the output.

Device Settings Page

The **Device Settings** page allows configuration of the input auto-switching and the tally out LED indication. Click the **Device Settings** button on the Global Navigation Bar to open the page.

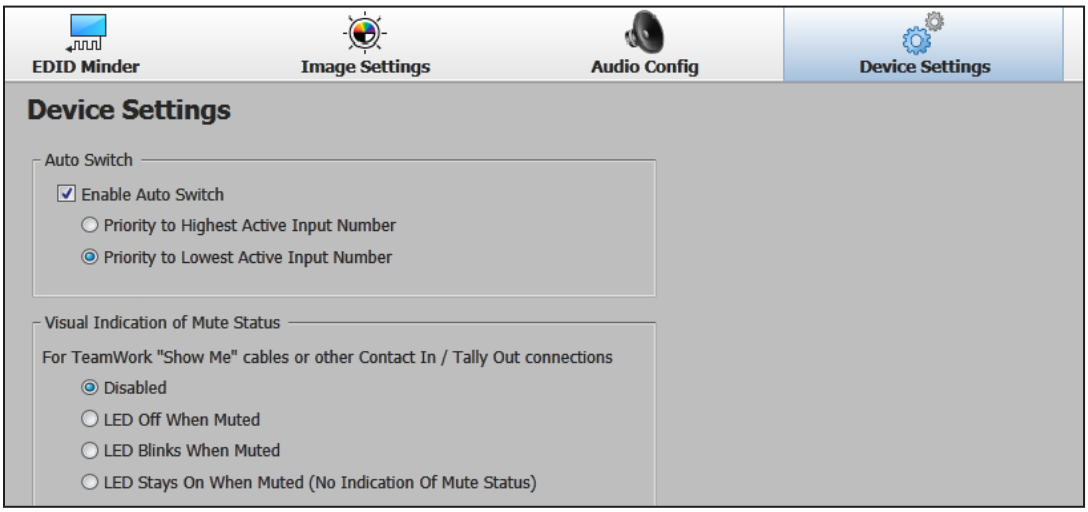

EDID Minder
Image Settings
Audio Config
Device Settings
Device Settings
Auto Switch
Enable Auto Switch
Priority to Highest Active Input Number
Priority to Lowest Active Input Number
Visual Indication of Mute Status
For TeamWork "Show Me" cables or other Contact In / Tally Out connections
Disabled
LED Off When Muted
LED Blinks When Muted
LED Stays On When Muted (No Indication Of Mute Status)

Figure 32. Device Settings Page

Auto Switch panel

In the absense of active video on the selected input, input auto-switch mode automatically switches inputs based on detected input signals.

1. Select the **Enable Auto Switch** check box to enable auto-input switch mode.
2. Click the radio button of the desired switch mode from the following:
   - **Priority to the highest active input number** — Automatically switches the input to the highest numbered input with active video.
   - **Priority to the lowest active input number** — Automatically switches the input to the lowest numbered input with active video.

Visual Indication of Mute Status panel

When an input uses the Extron “Show Me” cable or uses other Contact In / Tally Out connections, the tally indicator can be configured to show the current state of the input.

To configure the indicator select.

- **Disabled** — AV mute is disabled. The selection button provides input switching only with the LED visual indicator always solid. Subsequent selection button presses are ignored.
- **LED Off When Muted** — When selected, a subsequent selection button press button enables AV mute and shuts off the LED visual indicator. Another button press disables AV mute and restores the LED to solid.
- **LED Blinks When Muted** — When selected, a subsequent selection button press button enables AV mute and blinks the LED visual indicator. Another button press disables AV mute and restores the LED to solid.
- **LED Stays On When Muted** — When selected, a subsequent selection button press enables AV mute and the LED visual indicator remains lit solid. Another button press disables AV mute.

Hardware Pages

The Hardware pages contain unit information and options for device information, device naming, executive mode, and reset mode. Click the **Hardware** tab to open these pages.

Figure 33. Hardware Global Navigation Bar

Unit Information Page

This page gives a non-configurable view of information about the connected device. Click **Unit Information** to open the page.

The following information displays:

- **Part number** – The Extron part number of the connected MPS 601.
- **Model name** – The model name of the connected MPS 601.
- **Model description** – The model description of the connected MPS 601.
- **Firmware version** – The current firmware version of the connected MPS 601.

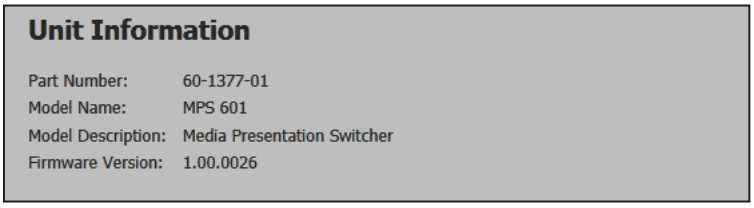


Figure 34. Unit Information Panel

Device Name Page

This page allows users to assign or change the name of the connected device. Click the **Device Name** icon on the Global Navigation Bar to open this page.

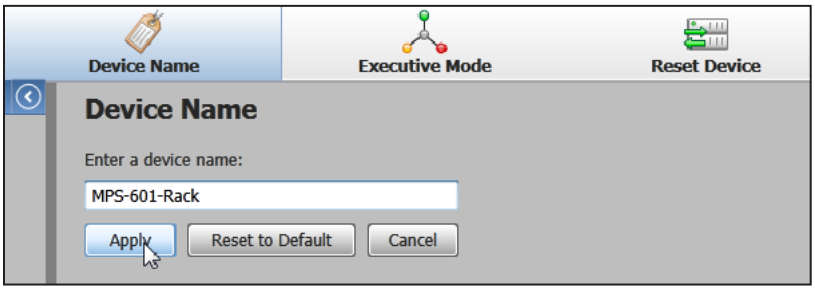


Figure 35. Device Name Page

To assign or change the device name:

1. Enter a name for the device in the name field. The name can be up to 63 alphanumeric characters in length with no spaces between characters. If an invalid name is entered, a red symbol appears to the right of the name field.
2. Click **Apply** to change the name or click **Cancel** to keep the previous name.

To reset the name to the factory default:

Click **Reset to Default**.

Executive Mode Page

The Executive Mode page contains options for enabling or disabling the front panel lockout mode. When enabled, executive mode provides security from an accidental or unauthorized front panel button press by locking out the input switching buttons. Click the **Executive Mode** icon on the Global Navigation Bar to open the page.

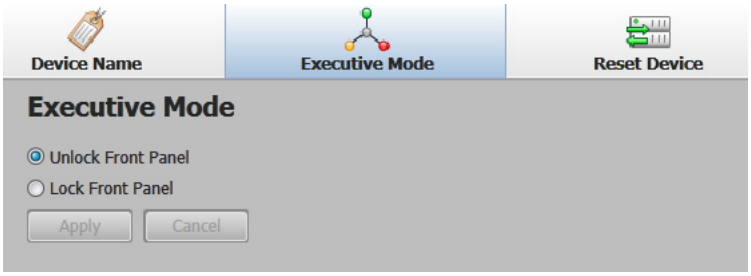


Figure 36. Executive/Power Mode Page

Executive mode

Front panel lockout (executive) mode locks the front panel functions of the switcher to avoid accidental button selection.

1. Select one of the following radio buttons to set the Executive mode (see **Front Panel Lockout (Executive Mode)** on page 14).
   - **Unlock the Front Panel** (default) – all front panel buttons are available.
   - **Lock Front Panel** (complete lockout) – no front panel buttons are available.
2. Click **Apply** to make the selected mode active.

NOTES:

- The RS-232 and USB ports are always accessible regardless of the executive mode state.
- All front panel LEDs flash twice to indicate that executive mode is enabled or to indicate it is disabled.
- While executive mode is enabled all front panel LEDs flash twice when any front panel button is pressed.

Reset Device Page

This page allows the user to reset the device. Click **Reset Device** on the Global Navigation Bar to open the page.

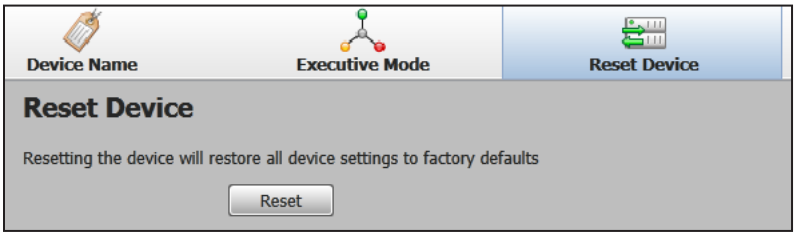


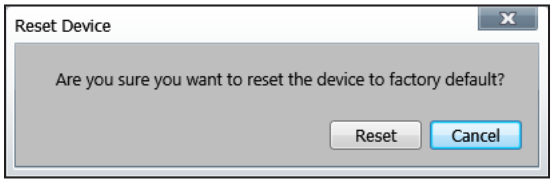
Figure 37. Reset Device Page

There is one reset option:

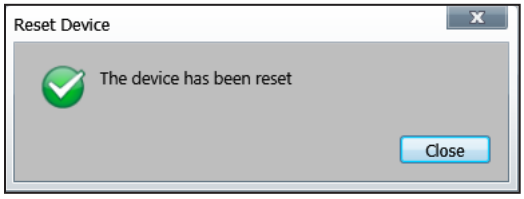
Reset Device — Resets all settings on the device to factory defaults.

To reset the device:

1. Click **Reset**. The Reset Device dialog opens.



2. Click **Reset** to continue or **Cancel** to abort the reset.
3. When the reset is complete, a confirmation dialog opens.



4. Close the dialog box.

Reference Information

This section discusses the specifications, part numbers, and accessories for the MPS 601. Topics that are covered, include:

- **Mounting Options**
- **DataViewer**
- **Updating Firmware**

Mounting Options

The MPS 601 is housed in 1U tall, half rack width, six inches deep metal enclosure, rack- or desk-mountable. The switcher can be mounted through-desk or rack mounted with optional rack mount brackets. The switchers can also be surface-mounted under a table, desk, or podium, or on a wall, using an optional under-desk mounting kit (see **www.extron.com**).

UL Rack Mounting Guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the MPS 601 in a rack.

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the device in an environment compatible with the maximum ambient temperature (Tma = +122 °F, +50 °C) specified by Extron.
2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Rack Mounting

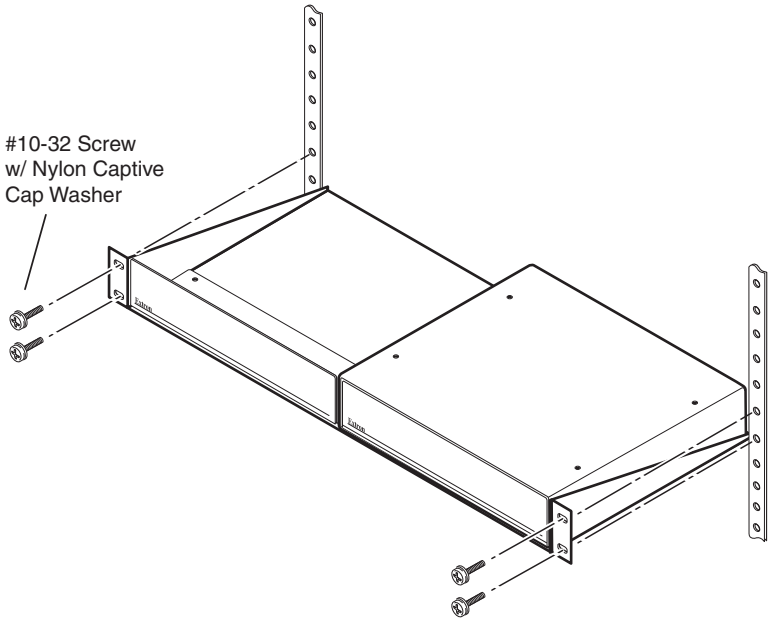


Figure 38. Mounting the Switcher

Table or Wall Mounting

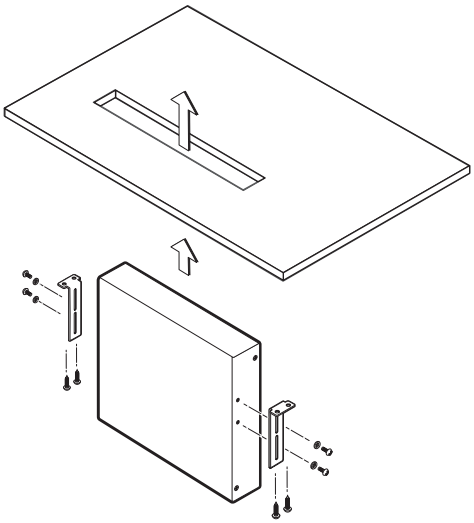
The table or wall mounting brackets extend approximately 1/4 inch (6.4 mm) above the top surface of the switcher enclosure allowing for an air space between the enclosure and the surface. Table or wall mount the switcher as follows:

1. Attach the table or wall mounting brackets to the switcher with the eight #8 machine screws (figure 37 on page 44).
2. Hold the switcher with the attached brackets against the underside of the table or other furniture, or against the wall. Mark the location of the screw holes of the bracket on the mounting surface.
3. Drill 3/32 inch (2 mm) diameter pilot holes, 1/4 inch (6.4 mm) deep in the mounting surface at the marked screw locations.
4. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4 inch of the screw's head protrudes.
5. Align the mounting screws with the slots in the brackets and place the switcher against the surface, with the screws through the bracket slots.
6. Slide the switcher slightly forward or back, then tighten all four screws to secure the switcher in place.

Through-desk Mounting

Mount the switcher through a desk or podium as follows:

1. Attach the mounting brackets to the switcher with the machine screws provided.
2. Cut the proper sized hole in the mounting surface.
3. Hold the switcher with the attached brackets against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill 3/32 inch (2 mm) diameter pilot holes, 1/4 inch (6.4 mm) deep in the mounting surface at the marked screw locations.
5. Insert four #8 wood screws through the bracket and into the four pilot holes. Tighten all four screws to secure the switcher in place.



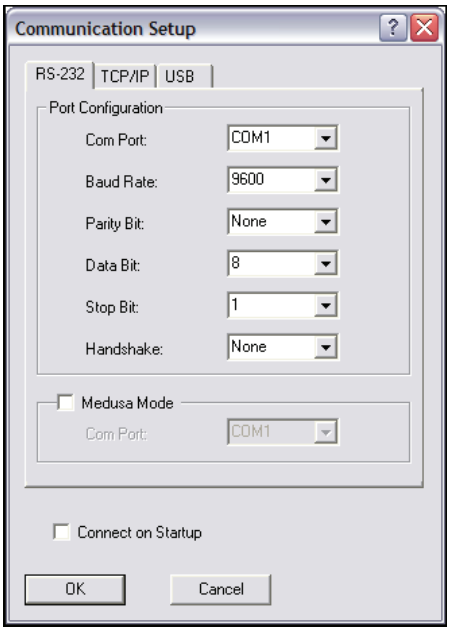
DataViewer

DataViewer is an enhanced terminal emulation program that facilitates analysis of RS-232, USB, and TCP/IP communication with Extron devices. The software allows users to send commands to a device and view the responses in ASCII or hexadecimal format. Command and response logs can be saved in text or HTML format.

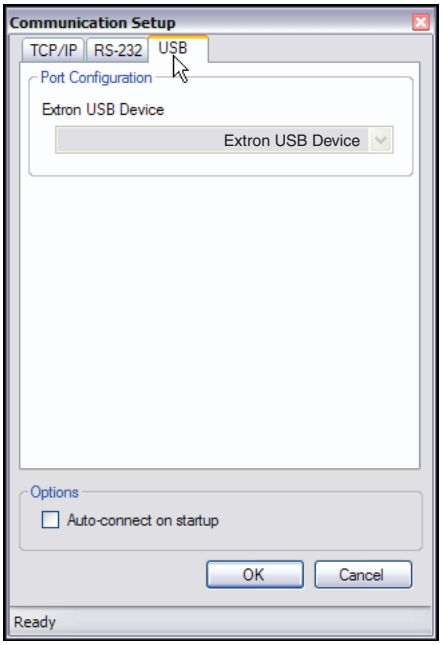
DataViewer is available on the included DVD or at **www.extron.com**. Download the installation file and load the program on the PC connected to the MPS 601.

Starting the DataViewer program

1. To run the DataViewer Control Program, click the desktop icon.
2. The Communications Setup dialog box opens.
   a. Select the **RS-232** tab (shown with the correct protocol settings at right) if using the rear panel RS-232 port, or



   b. Select the **USB** tab if using the front panel config port.
3. Select the startup options:
   a. If RS-232 is selected, configure the protocol settings, then click **OK** to always use this port and settings when starting the DataViewer program.
   b. If USB is selected, choose **Extron USB Device** in the drop-down window and click **OK**.
   To automatically connect to the MPS 601, select **Auto-connect on startup** .
4. Click **OK** to start using the program.



You are now ready to configure DataViewer or begin entering commands.

Use the DataViewer help file for more information on the program.

Updating Firmware

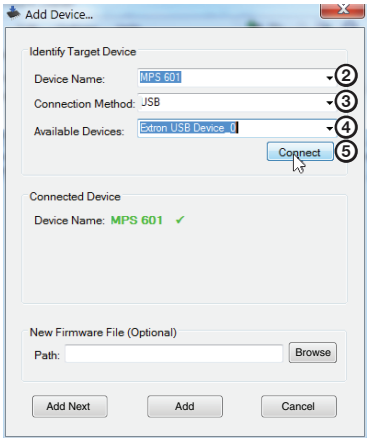
The MPS 601 firmware can be updated using the PCS firmware update option (see **Update Firmware** on page 31) or using the Extron Firmware Loader program. To update the firmware using either method, the latest firmware must first be obtained from the website.

Download the latest firmware file:

1. Visit the Extron website, **www.extron.com**. From the Product page, locate and select the MPS 601 (in the left column select **Switchers > Media Presentation Switchers > MPS601**).
2. On the MPS 601 product page, click the **Downloads** tab and locate the most recent firmware file, release notes, and firmware update instructions. Save these files on your computer hard drive, noting the file path of the folder where the files have been saved.

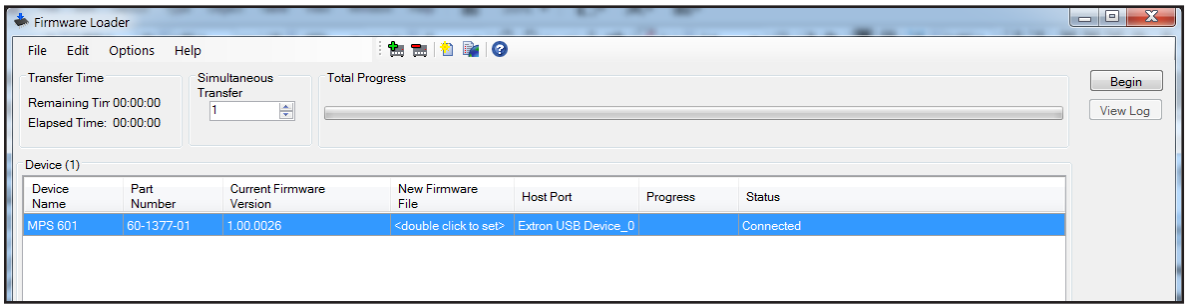
To access the firmware loader:

1. From the Windows start menu, select **All Programs > Extron > Firmware Loader > Firmware Loader** .
2. The **Add Device** dialog box opens. Select the MPS 601 device name from the drop-down list.
3. Select USB from the drop-down list as the connection method.
4. Select the Extron USB device from available devices.



5. Click **Connect**.

   The main screen opens.



6. From the toolbar, select **File > Open**.
7. Locate the previously downloaded firmware file and click once to select it.
8. Click **Begin** on the main screen. The total progress bar tracks the loading progress.
9. When the **Transfer Complete!** message appears, the upload is finished. Select **File > Exit** to exit the program.

The firmware upload is complete.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1230 South Lewis Street
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U.S.A.

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Japan

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Singapore 368363
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Middle East:
Extron Middle East
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This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876
Asia: 65.6383.4400
Europe: 31.33.453.4040
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

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